US007722452B2

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Miura et al.

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(45) **Date of Patent: May 25, 2010**

(54) **GAME PROGRAM AND GAME DEVICE**

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(73) Assignee: **Nintendo Co., Ltd.**, Kyoto (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 540 days.

(21) Appl. No.: **11/505,831**

(22) Filed: **Aug. 18, 2006**

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(30) **Foreign Application Priority Data**

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(51) **Int. Cl.**
A63F 9/24 (2006.01)

(52) **U.S. Cl.** ..... **463/9**; 463/2; 463/7; 463/23; 273/153 R; 273/153 S; 273/157 R; 273/155

(58) **Field of Classification Search** 463/9, 463/2, 7, 23
See application file for complete search history.

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Yoshi's Cookie Manual, <http://www.replacementdocs.com/download.php?view.1296>, Oct. 2008.*
Planet Puzzle League Manual, <http://www.replacementdocs.com/download.php?view.5495>, Oct. 2008.*

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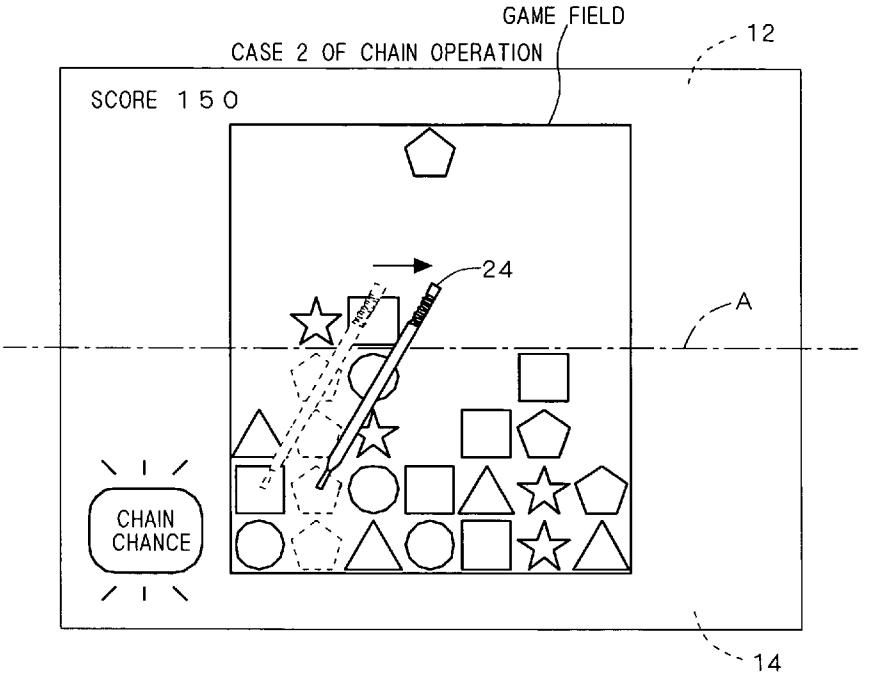
Assistant Examiner—Chase Leichliter
(74) *Attorney, Agent, or Firm*—Nixon & Vanderhye P.C.

(57) **ABSTRACT**

A game program of the present invention causes a computer to execute a first delete condition setting step of setting a delete condition of puzzle elements in which puzzle elements of the same kind in a first number or more are continuously arranged in a predetermined direction as a first delete condition and a second delete condition setting step of setting a next delete condition of the puzzle elements in which puzzle elements of the same kind in a second number which is smaller than the first number or more are continuously arranged in a predetermined direction as a second delete condition when it is judged that the first delete condition is achieved in the first delete condition judgment step.

12 Claims, 30 Drawing Sheets



F I G . 1

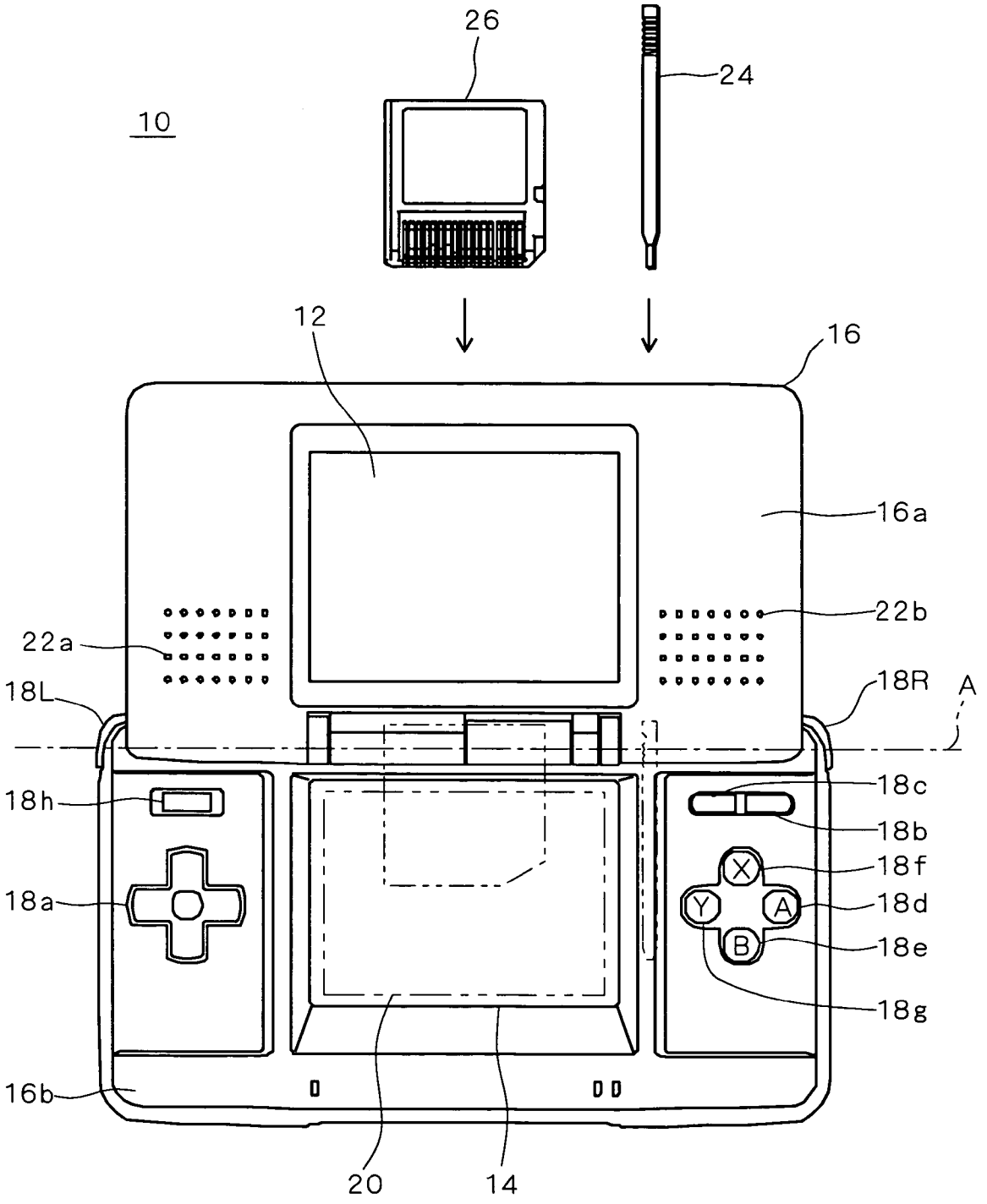

10
26
24
12
16
16a
22b
22a
18L
18R
A
18h
18c
18b
18a
18f
18d
18e
18g
16b
20
14
X
Y
A
B

FIG. 2

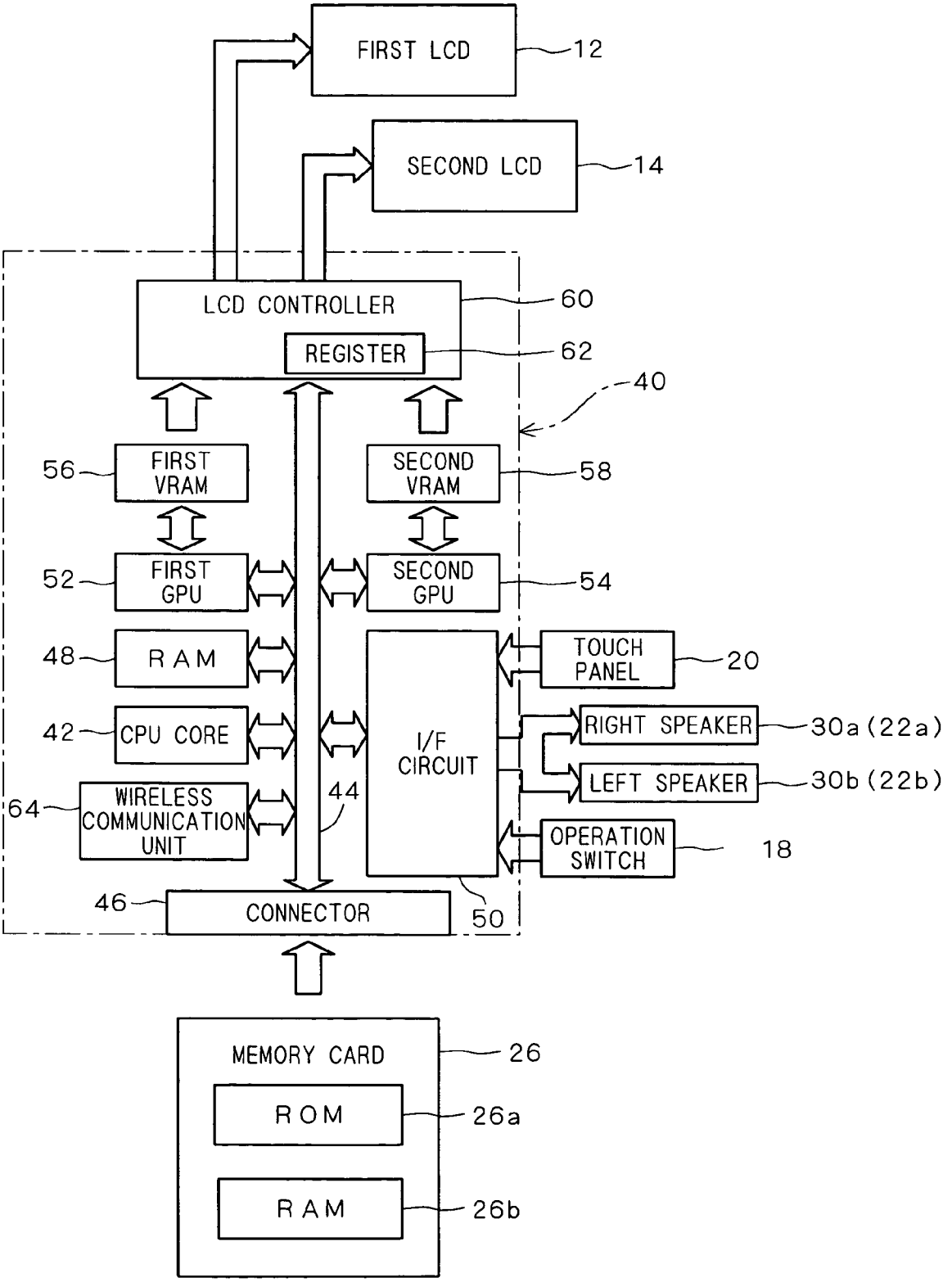

FIRST LCD
12
SECOND LCD
14
LCD CONTROLLER
60
REGISTER
62
40
56
FIRST VRAM
SECOND VRAM
58
52
FIRST GPU
SECOND GPU
54
48
RAM
TOUCH PANEL
20
42
CPU CORE
I/F CIRCUIT
RIGHT SPEAKER
30a (22a)
LEFT SPEAKER
30b (22b)
64
WIRELESS COMMUNICATION UNIT
44
OPERATION SWITCH
18
46
CONNECTOR
50
MEMORY CARD
26
ROM
26a
RAM
26b

FIG. 3

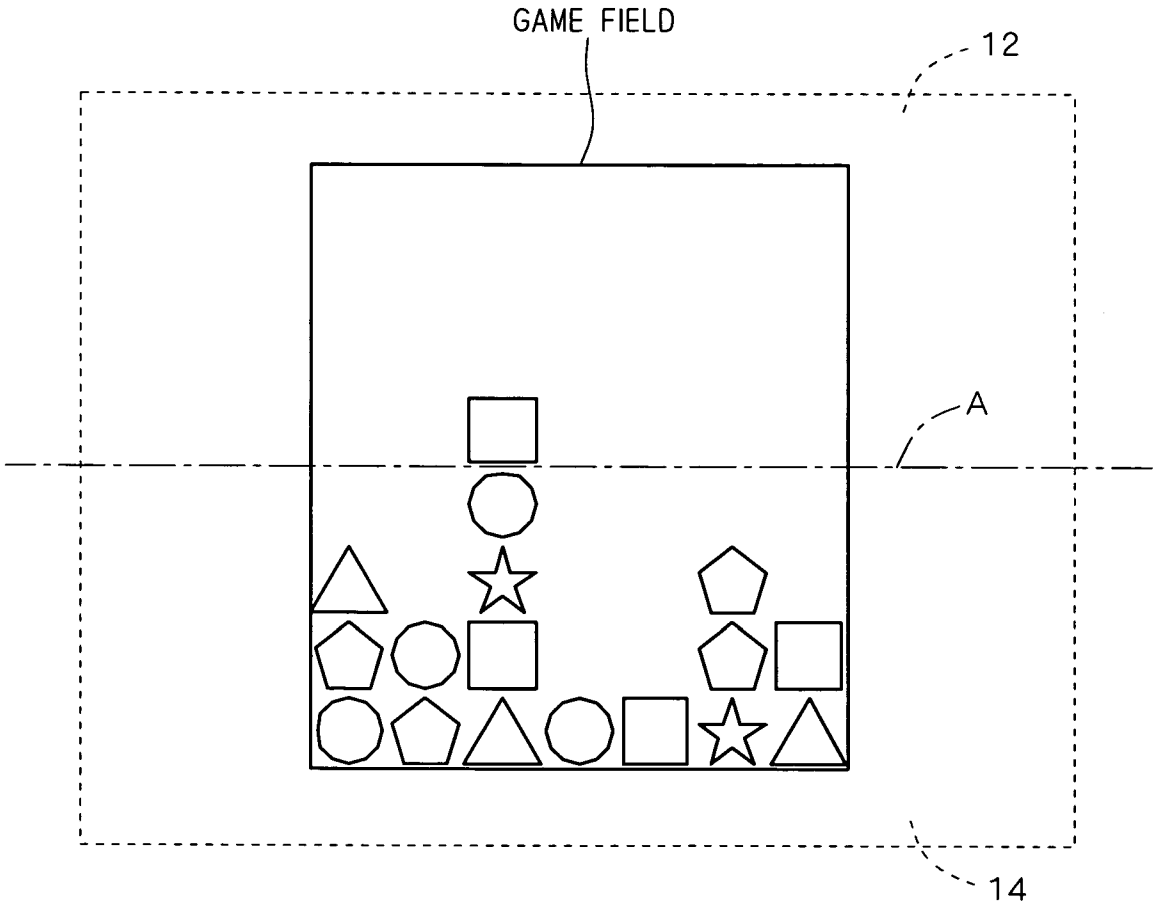


FIG. 4

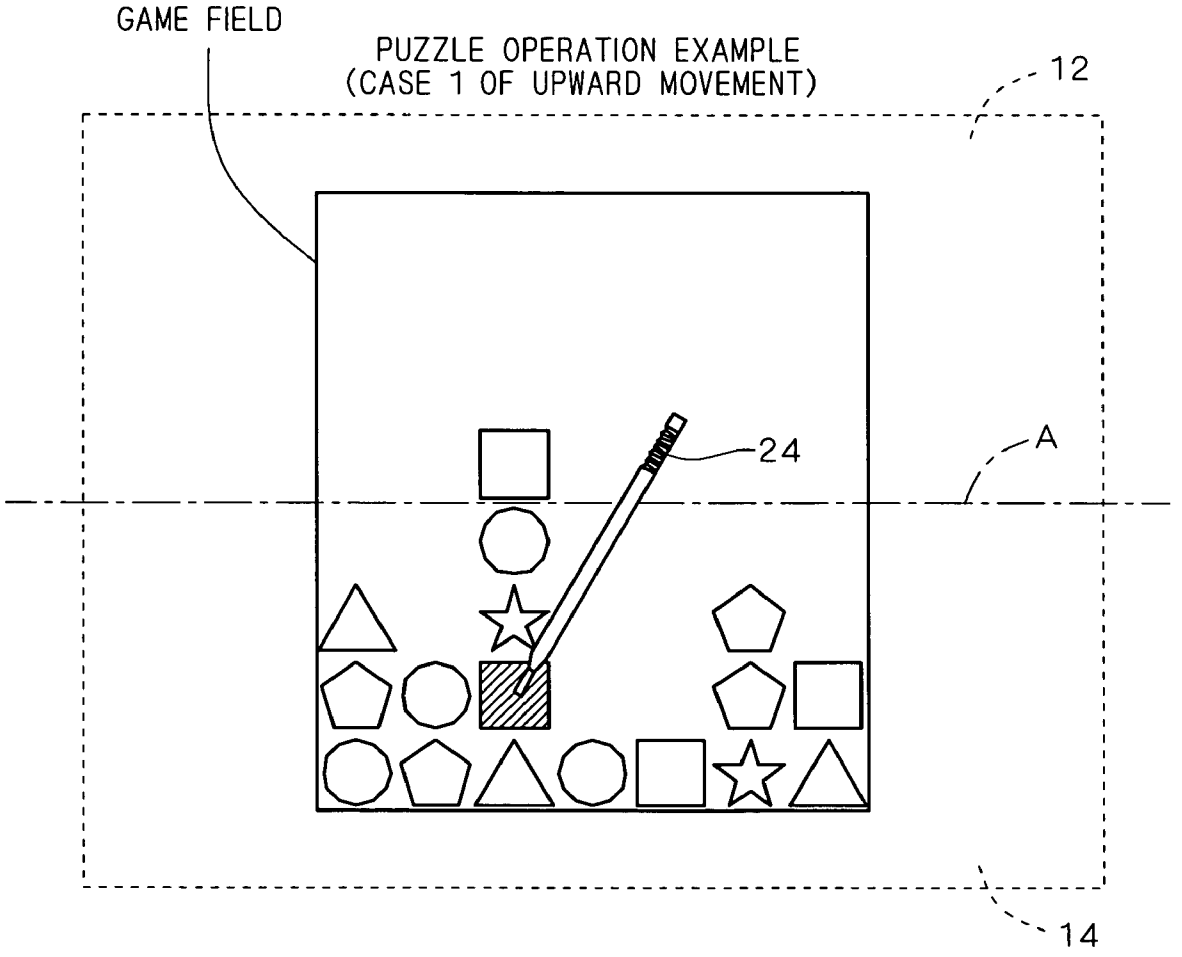

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 1 OF UPWARD MOVEMENT)
12
24
A
14

FIG. 5

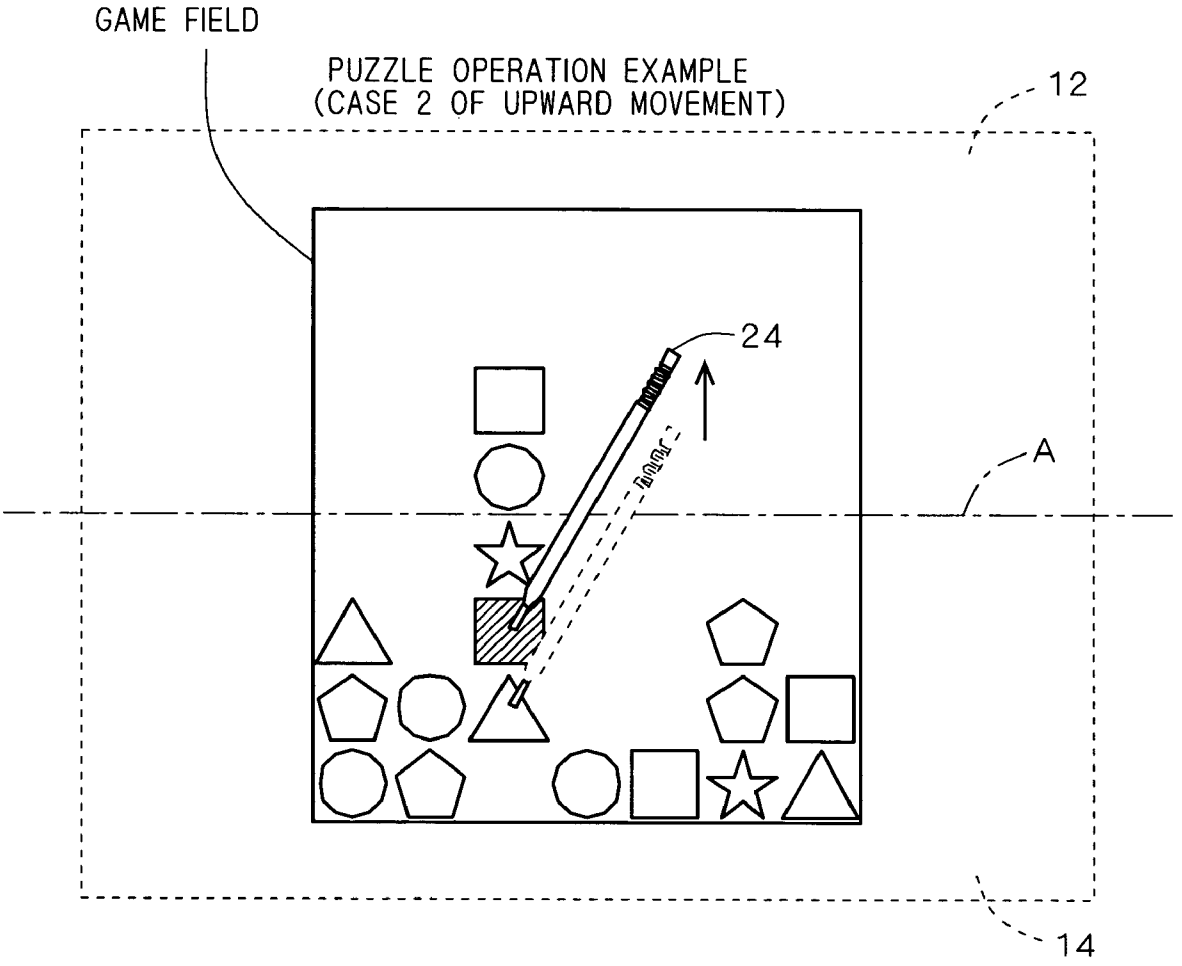

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 2 OF UPWARD MOVEMENT)
12
24
A
14

FIG. 6

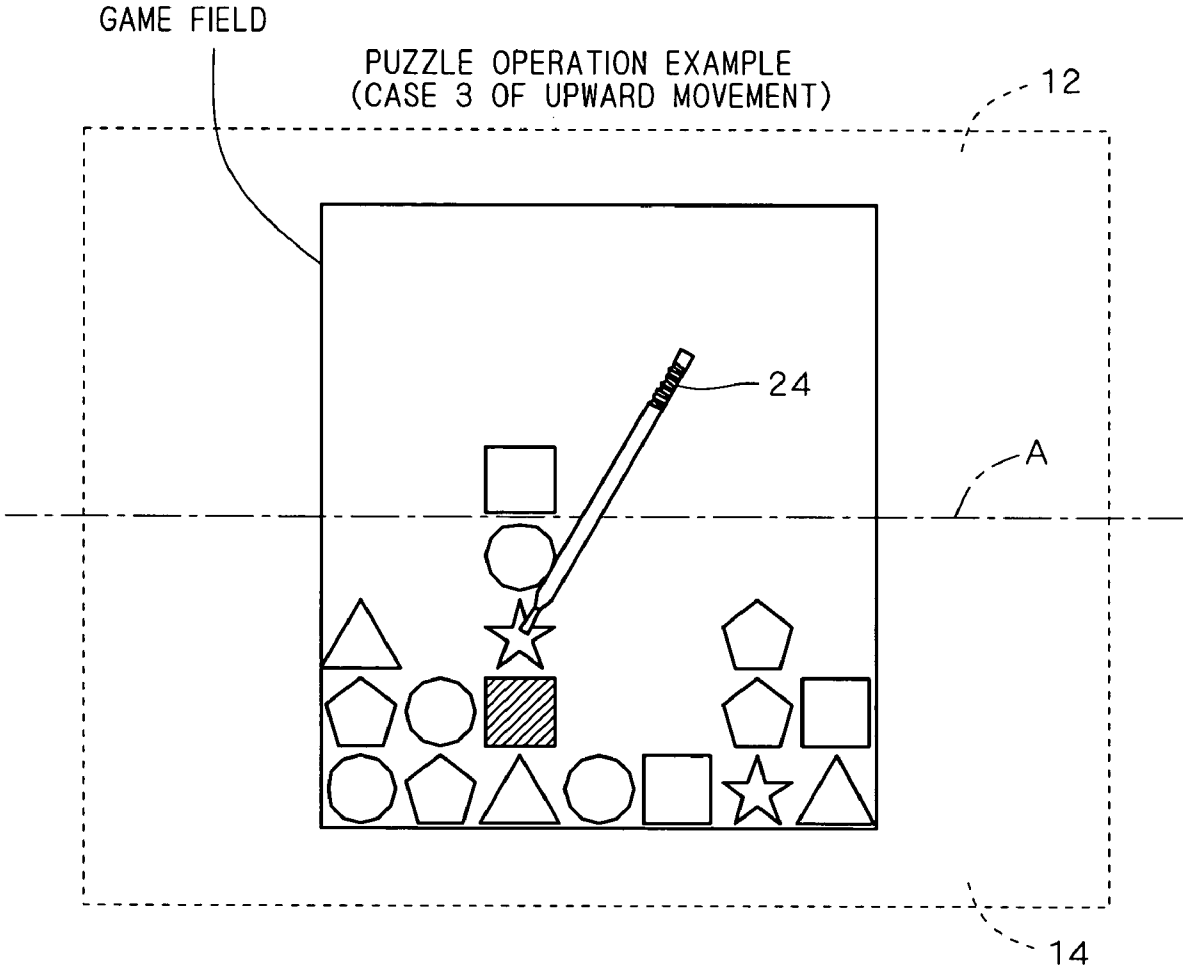

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 3 OF UPWARD MOVEMENT)
12
24
A
14

FIG. 7

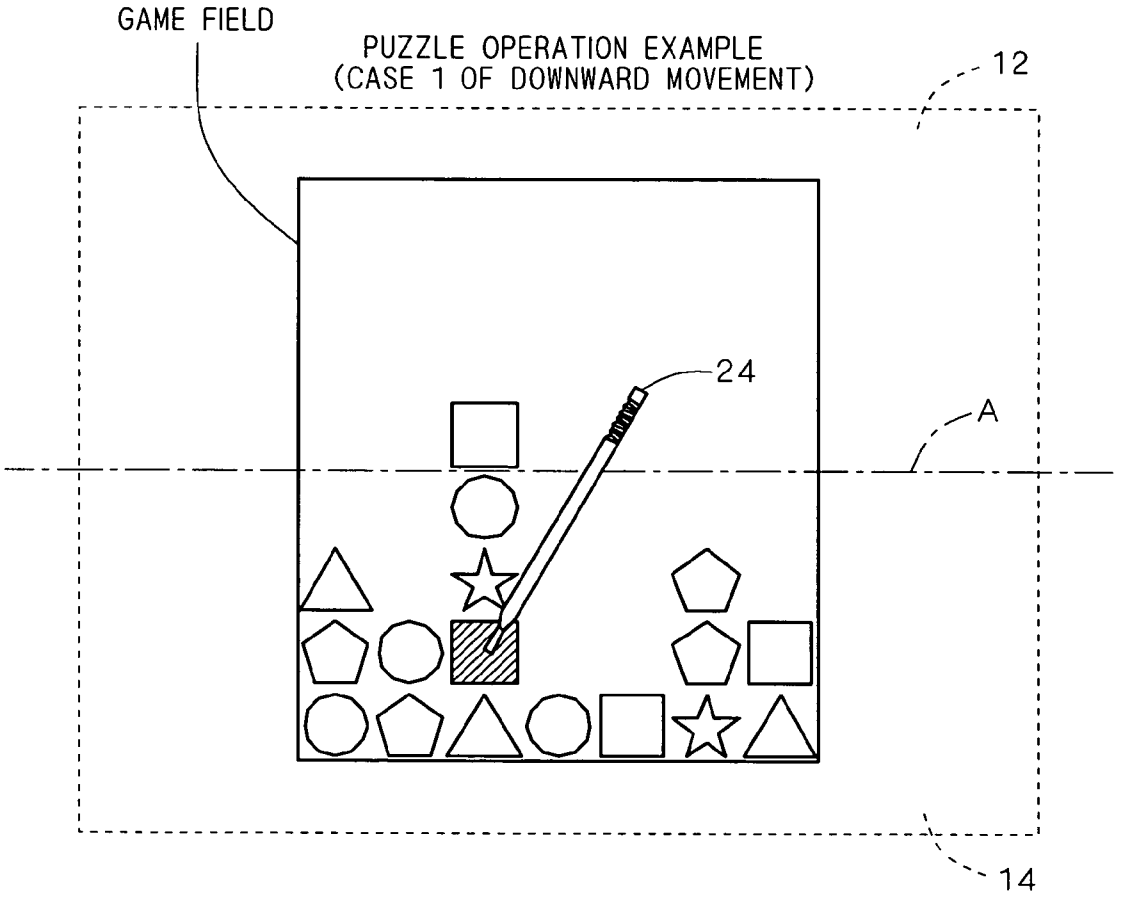

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 1 OF DOWNWARD MOVEMENT)
12
24
A
14

FIG. 8

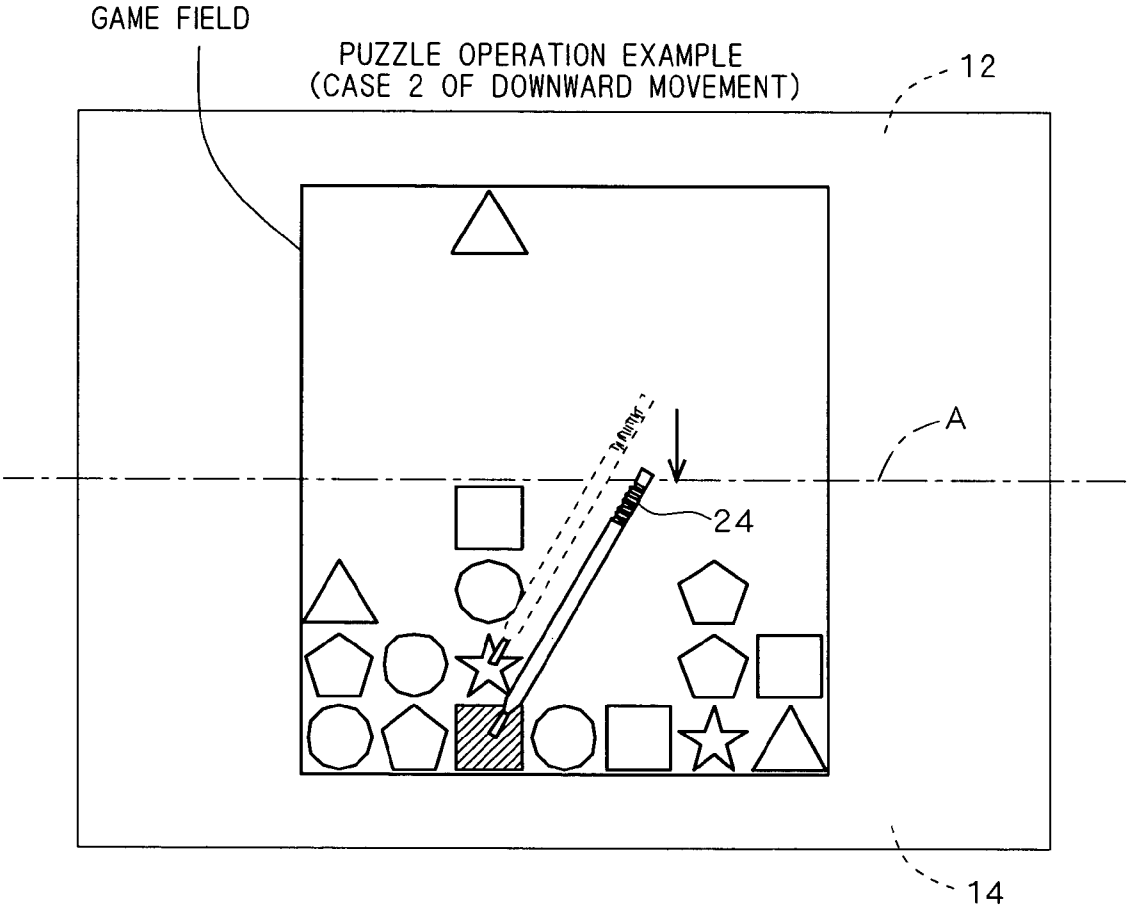

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 2 OF DOWNWARD MOVEMENT)
12
A
24
14

FIG. 9

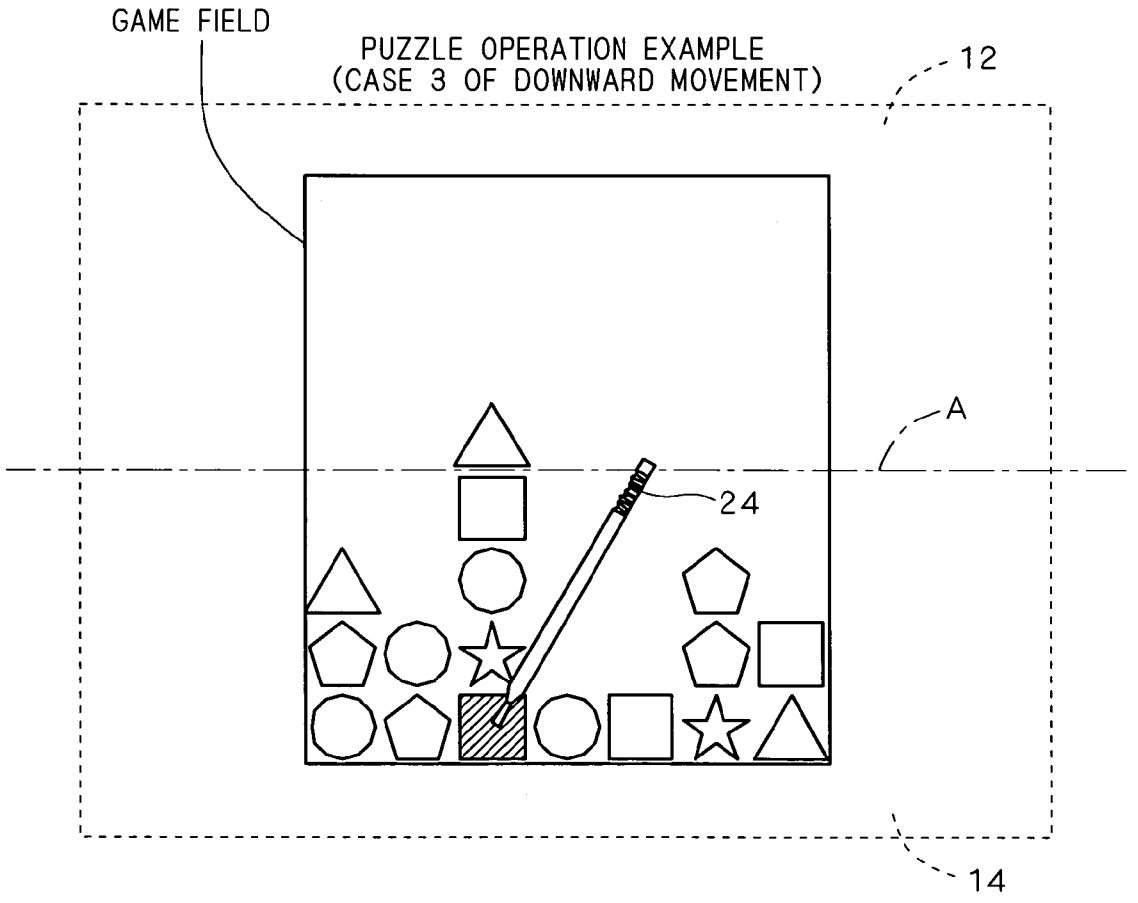

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 3 OF DOWNWARD MOVEMENT)
12
A
24
14

FIG. 10

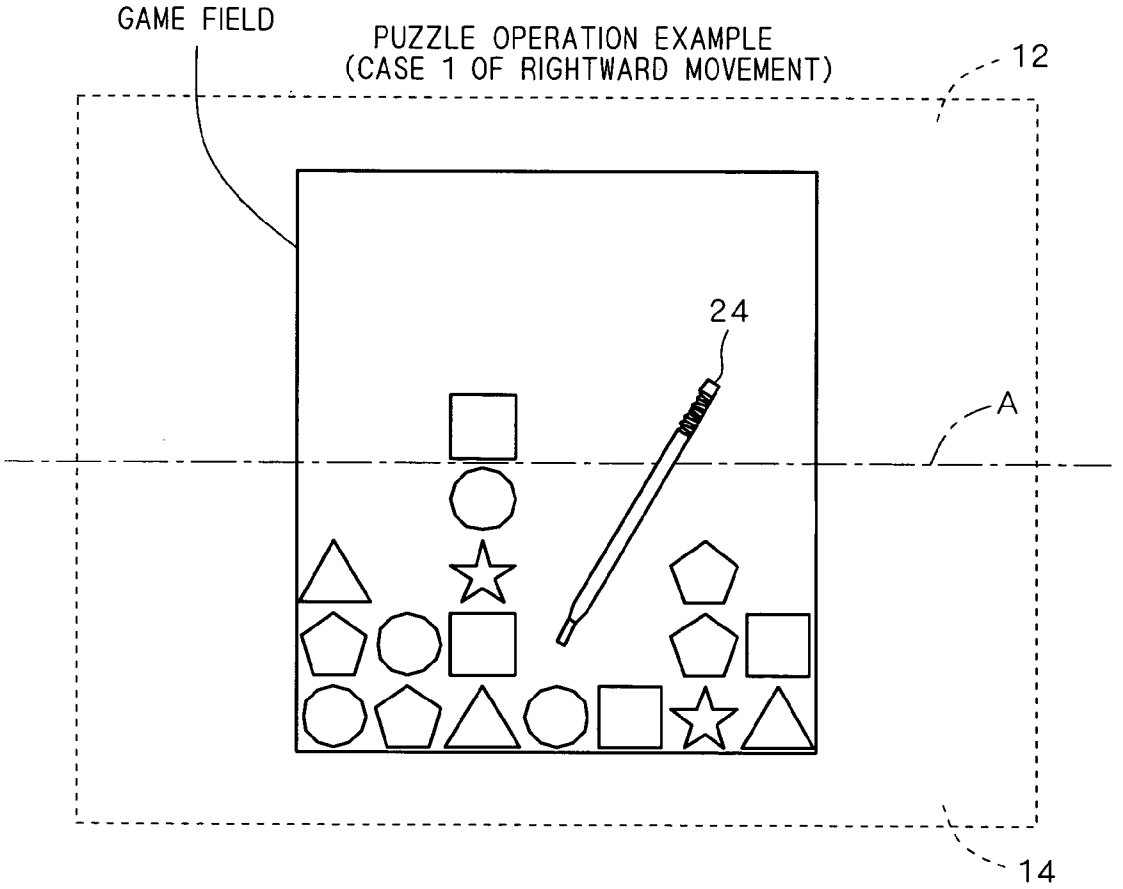

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 1 OF RIGHTWARD MOVEMENT)
12
24
A
14

FIG. 11

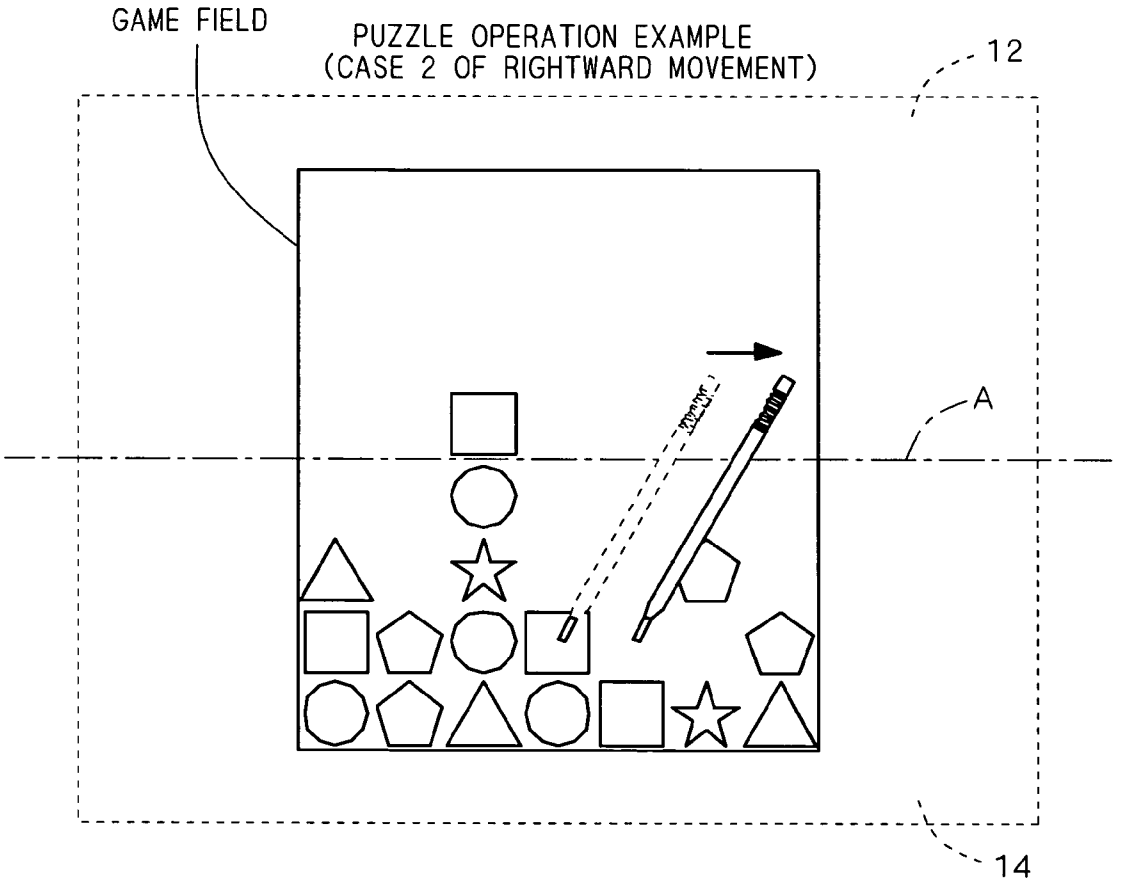

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 2 OF RIGHTWARD MOVEMENT)
12
A
14

FIG. 12

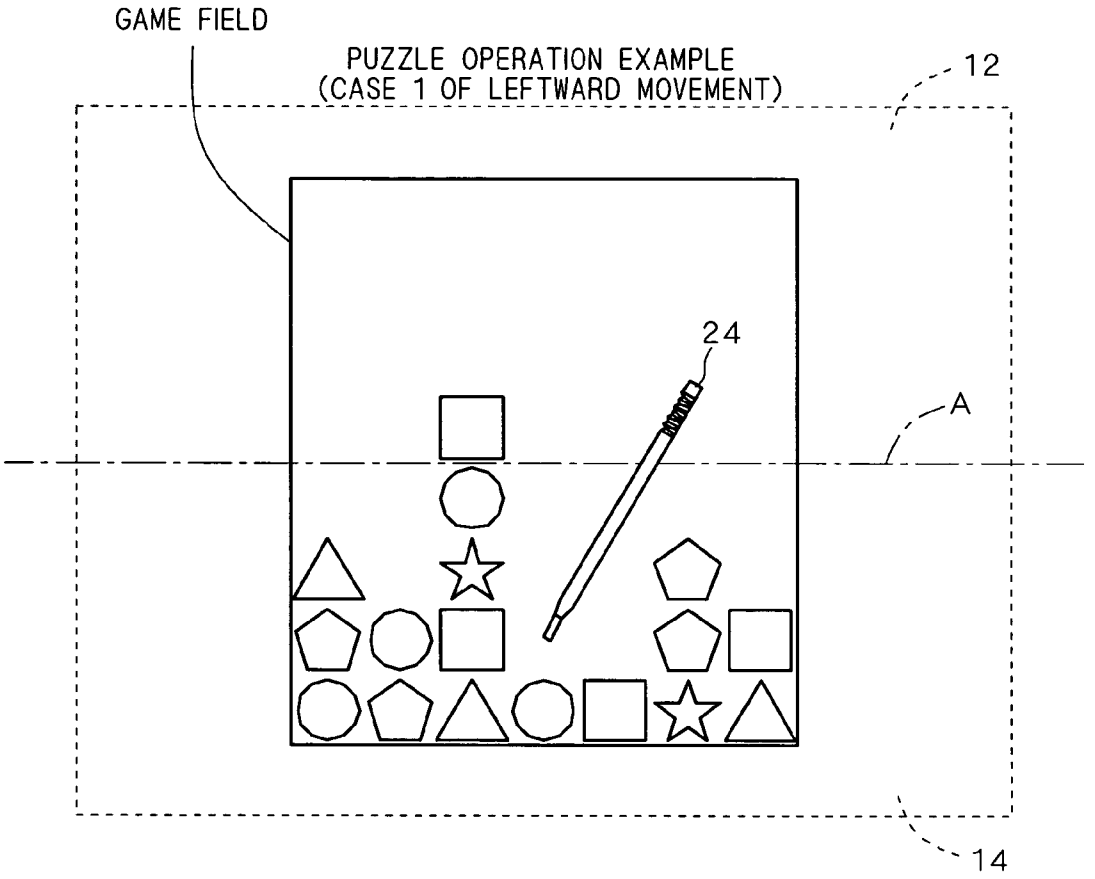

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 1 OF LEFTWARD MOVEMENT)
12
24
A
14

FIG. 13

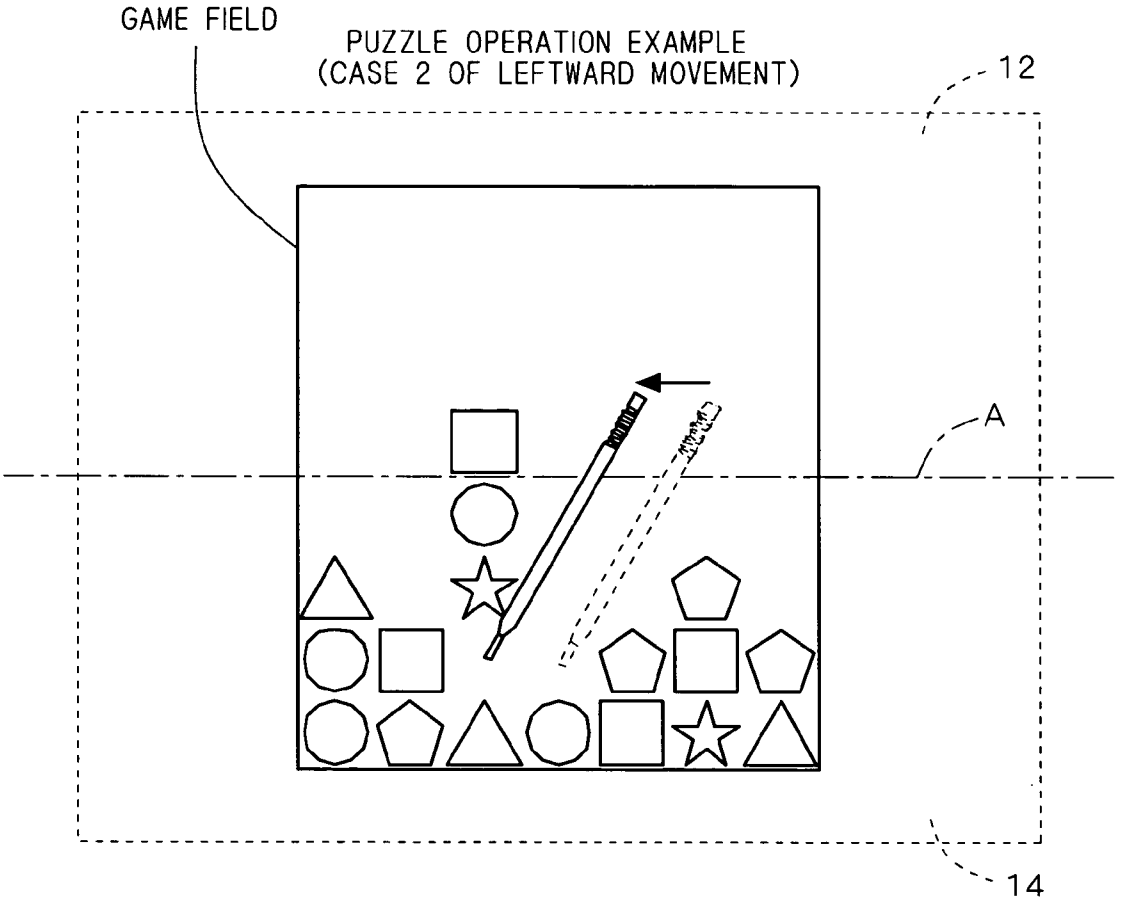

GAME FIELD
PUZZLE OPERATION EXAMPLE
(CASE 2 OF LEFTWARD MOVEMENT)
12
A
14

FIG. 14

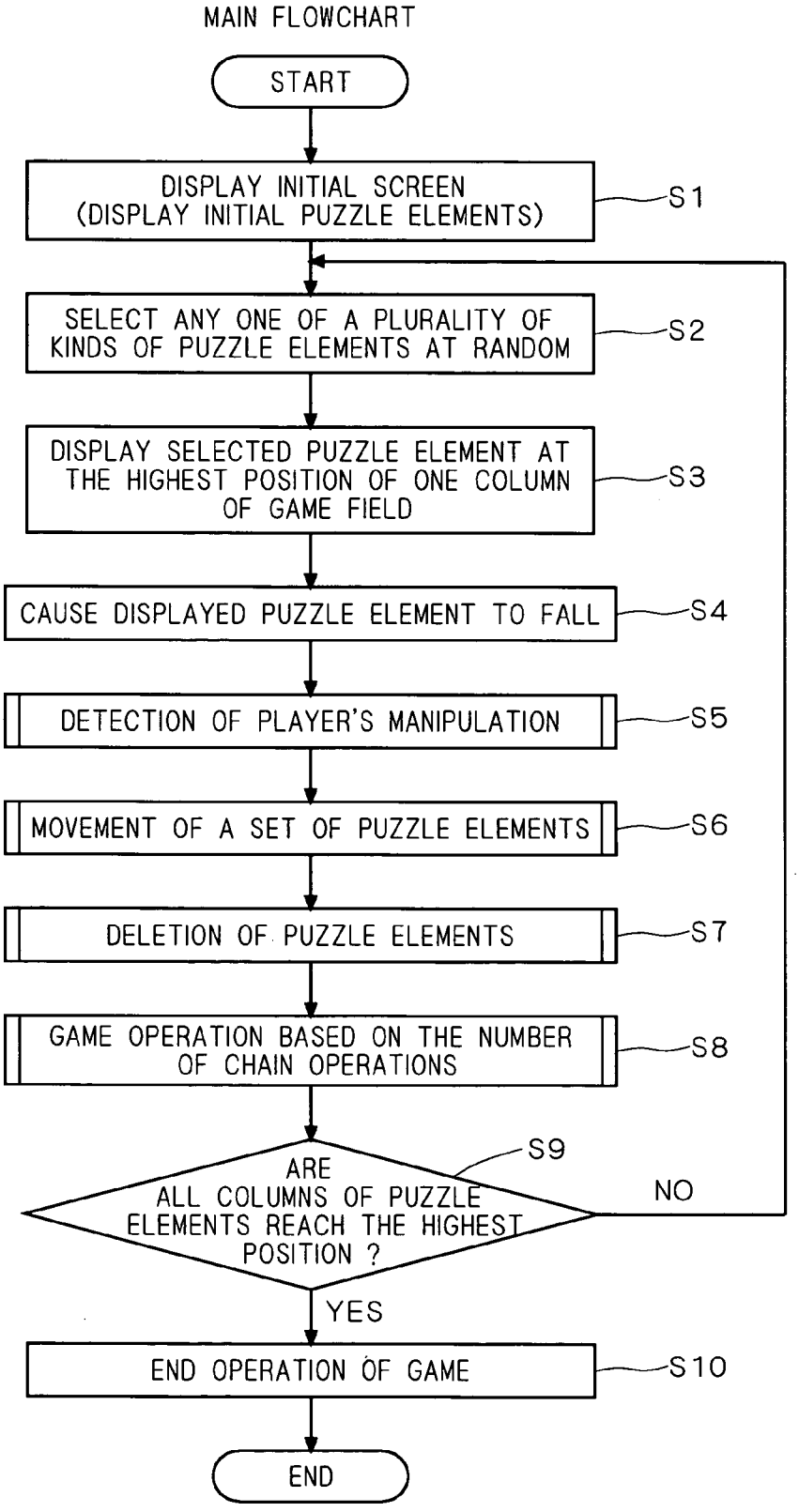

MAIN FLOWCHART
START
DISPLAY INITIAL SCREEN (DISPLAY INITIAL PUZZLE ELEMENTS)
S1
SELECT ANY ONE OF A PLURALITY OF KINDS OF PUZZLE ELEMENTS AT RANDOM
S2
DISPLAY SELECTED PUZZLE ELEMENT AT THE HIGHEST POSITION OF ONE COLUMN OF GAME FIELD
S3
CAUSE DISPLAYED PUZZLE ELEMENT TO FALL
S4
DETECTION OF PLAYER'S MANIPULATION
S5
MOVEMENT OF A SET OF PUZZLE ELEMENTS
S6
DELETION OF PUZZLE ELEMENTS
S7
GAME OPERATION BASED ON THE NUMBER OF CHAIN OPERATIONS
S8
ARE ALL COLUMNS OF PUZZLE ELEMENTS REACH THE HIGHEST POSITION ?
S9
NO
YES
END OPERATION OF GAME
S10
END

FIG. 15

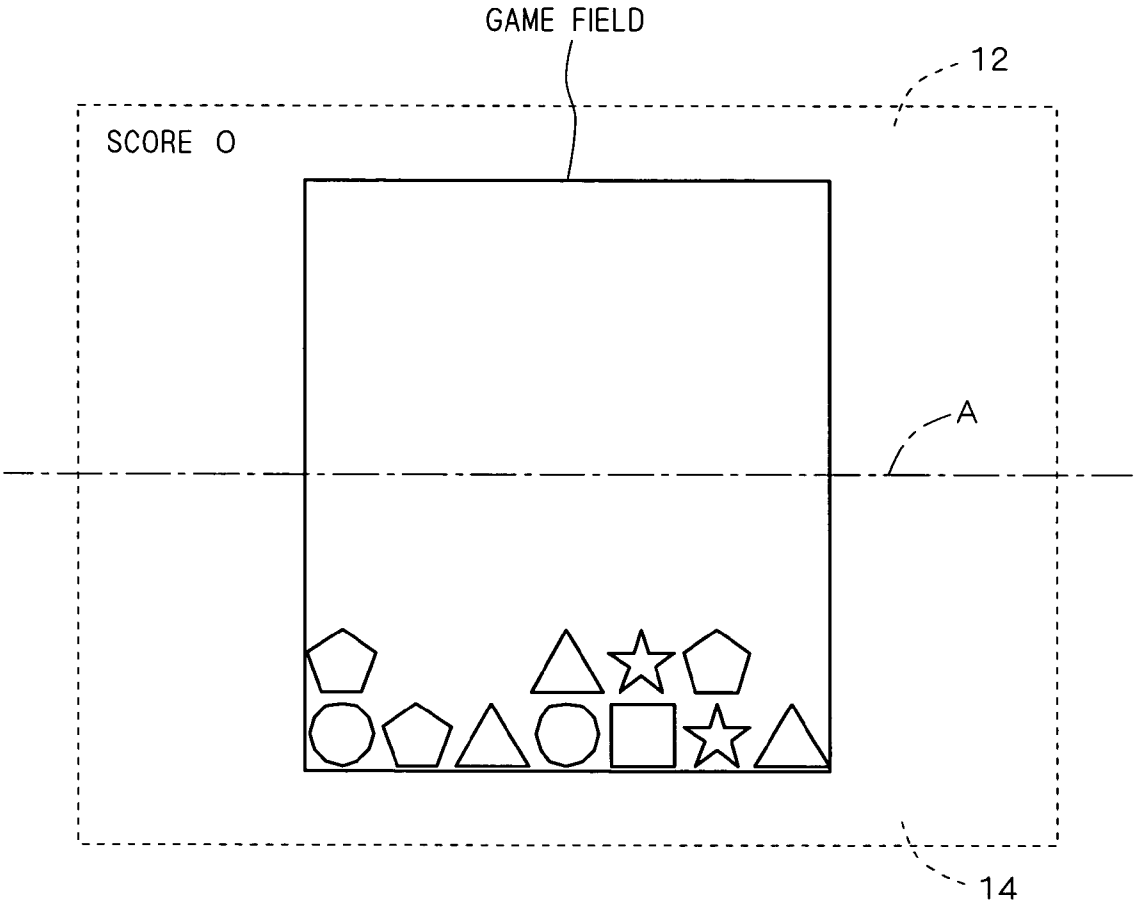


FIG. 16

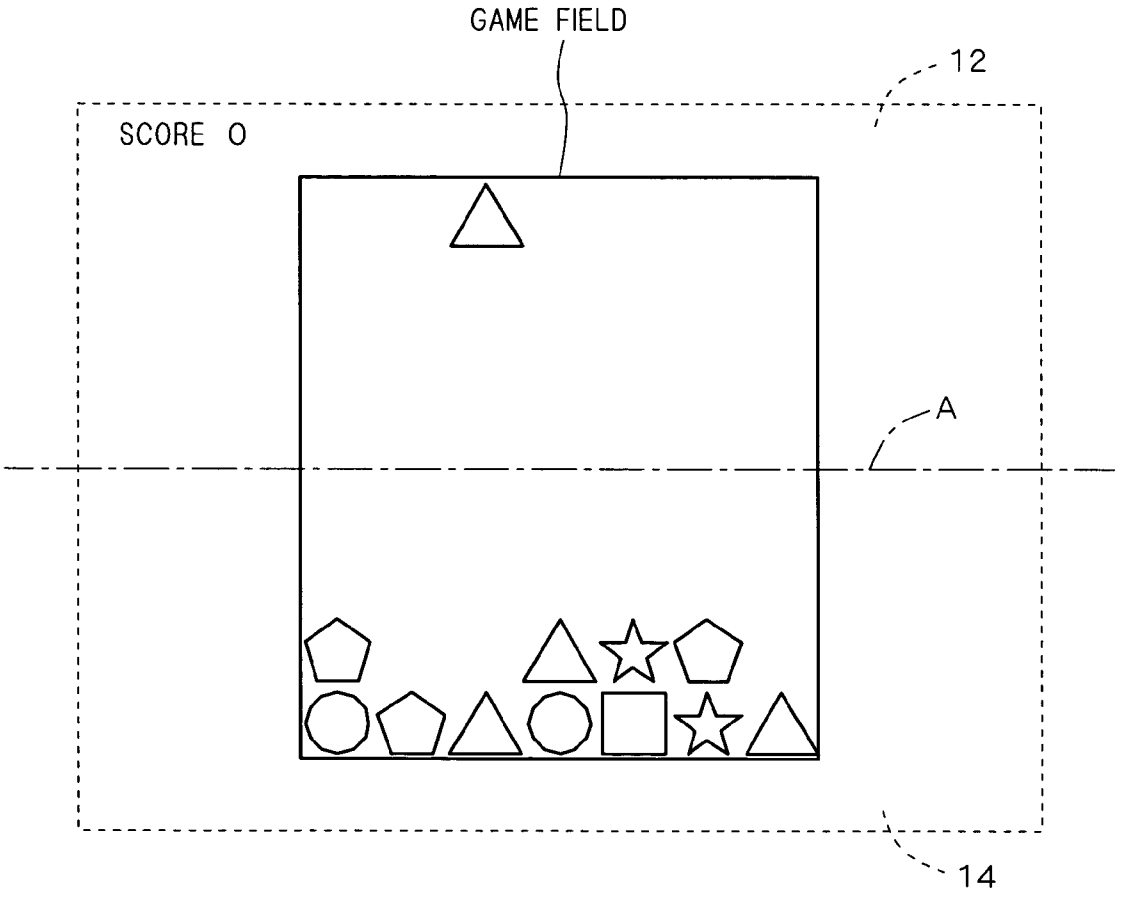


FIG. 17

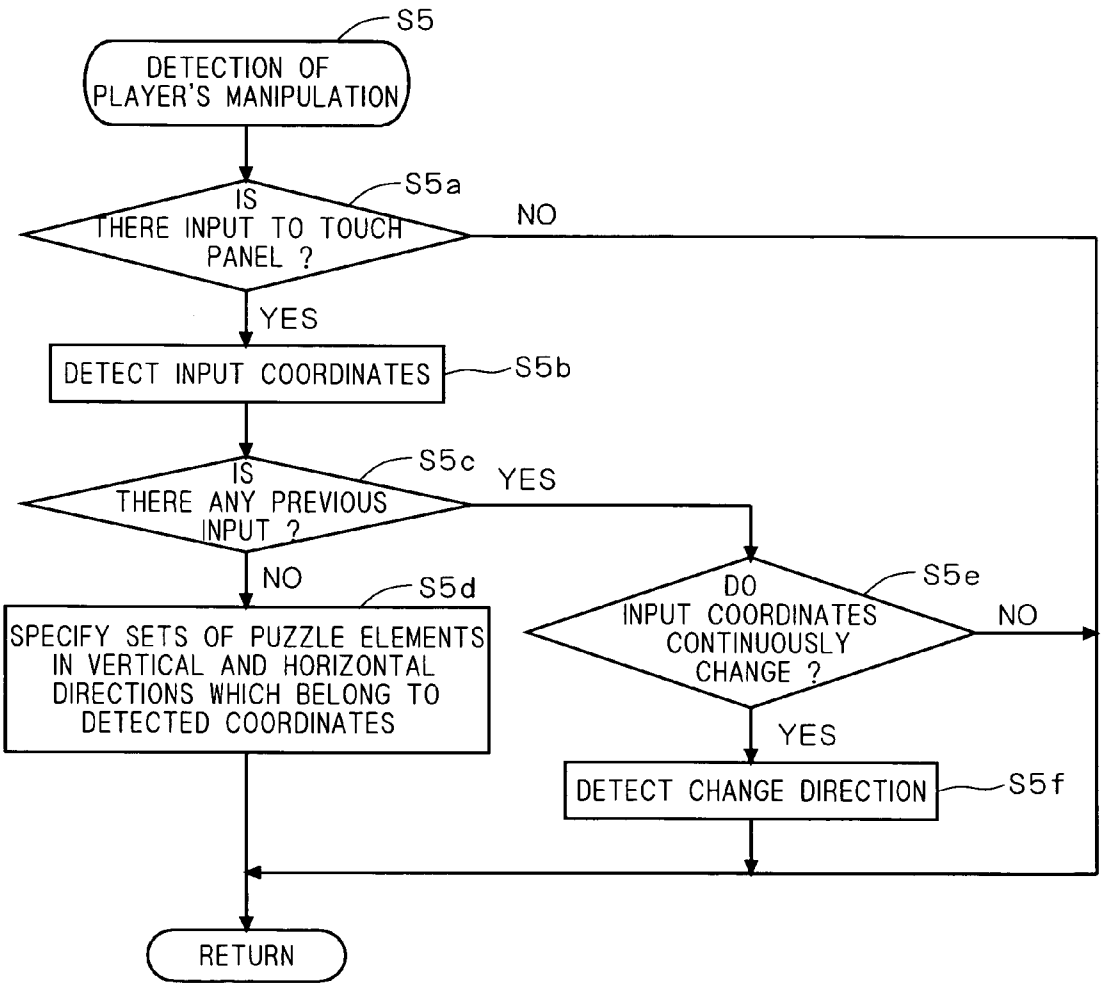

S5
DETECTION OF PLAYER'S MANIPULATION
S5a
IS THERE INPUT TO TOUCH PANEL ?
NO
YES
DETECT INPUT COORDINATES
S5b
S5c
IS THERE ANY PREVIOUS INPUT ?
YES
NO
S5d
SPECIFY SETS OF PUZZLE ELEMENTS IN VERTICAL AND HORIZONTAL DIRECTIONS WHICH BELONG TO DETECTED COORDINATES
S5e
DO INPUT COORDINATES CONTINUOUSLY CHANGE ?
NO
YES
DETECT CHANGE DIRECTION
S5f
RETURN

FIG. 18

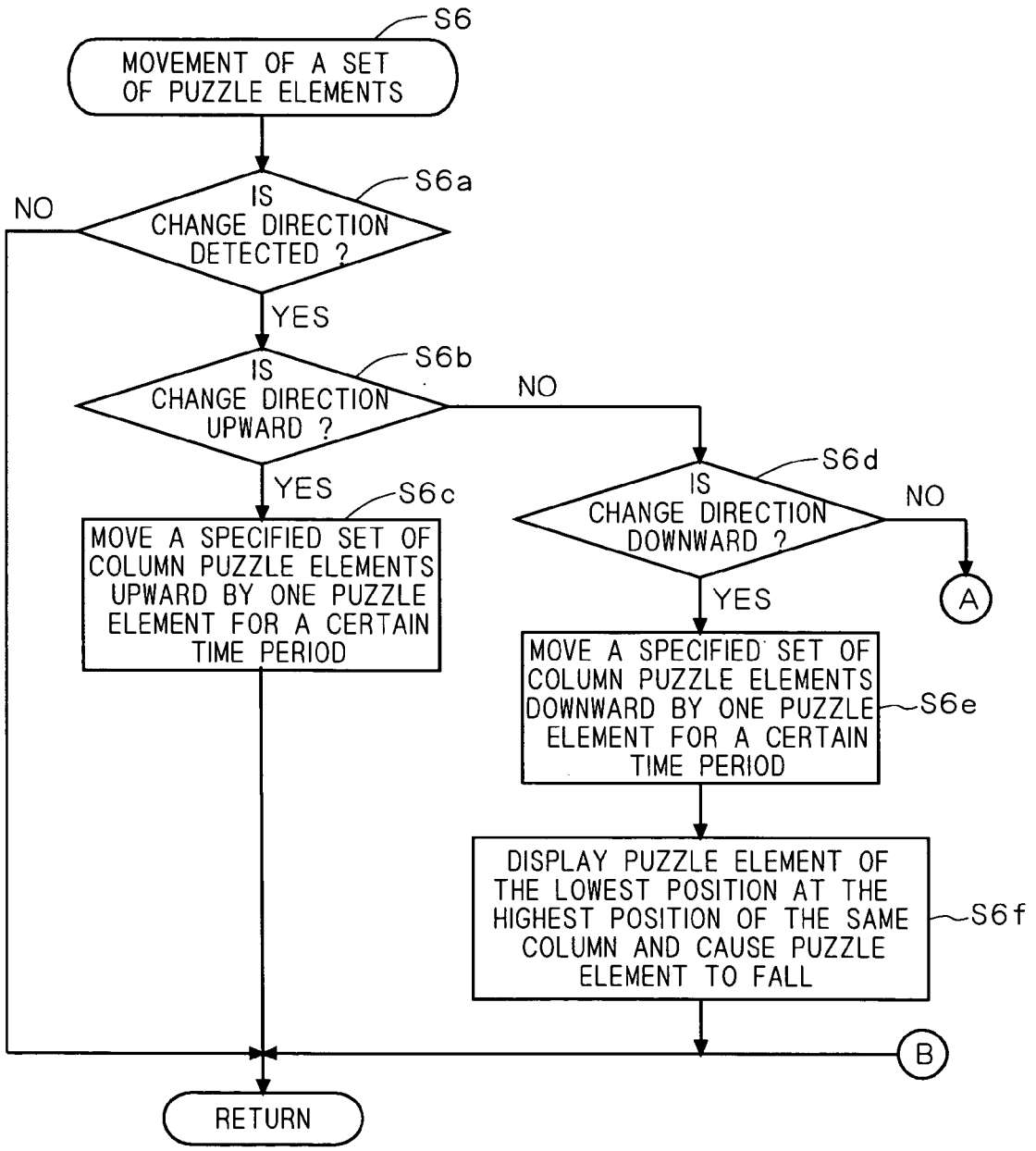

S6
MOVEMENT OF A SET OF PUZZLE ELEMENTS
S6a
IS CHANGE DIRECTION DETECTED ?
NO
YES
S6b
IS CHANGE DIRECTION UPWARD ?
NO
YES
S6c
MOVE A SPECIFIED SET OF COLUMN PUZZLE ELEMENTS UPWARD BY ONE PUZZLE ELEMENT FOR A CERTAIN TIME PERIOD
S6d
IS CHANGE DIRECTION DOWNWARD ?
NO
YES
A
S6e
MOVE A SPECIFIED SET OF COLUMN PUZZLE ELEMENTS DOWNWARD BY ONE PUZZLE ELEMENT FOR A CERTAIN TIME PERIOD
S6f
DISPLAY PUZZLE ELEMENT OF THE LOWEST POSITION AT THE HIGHEST POSITION OF THE SAME COLUMN AND CAUSE PUZZLE ELEMENT TO FALL
B
RETURN

FIG. 19

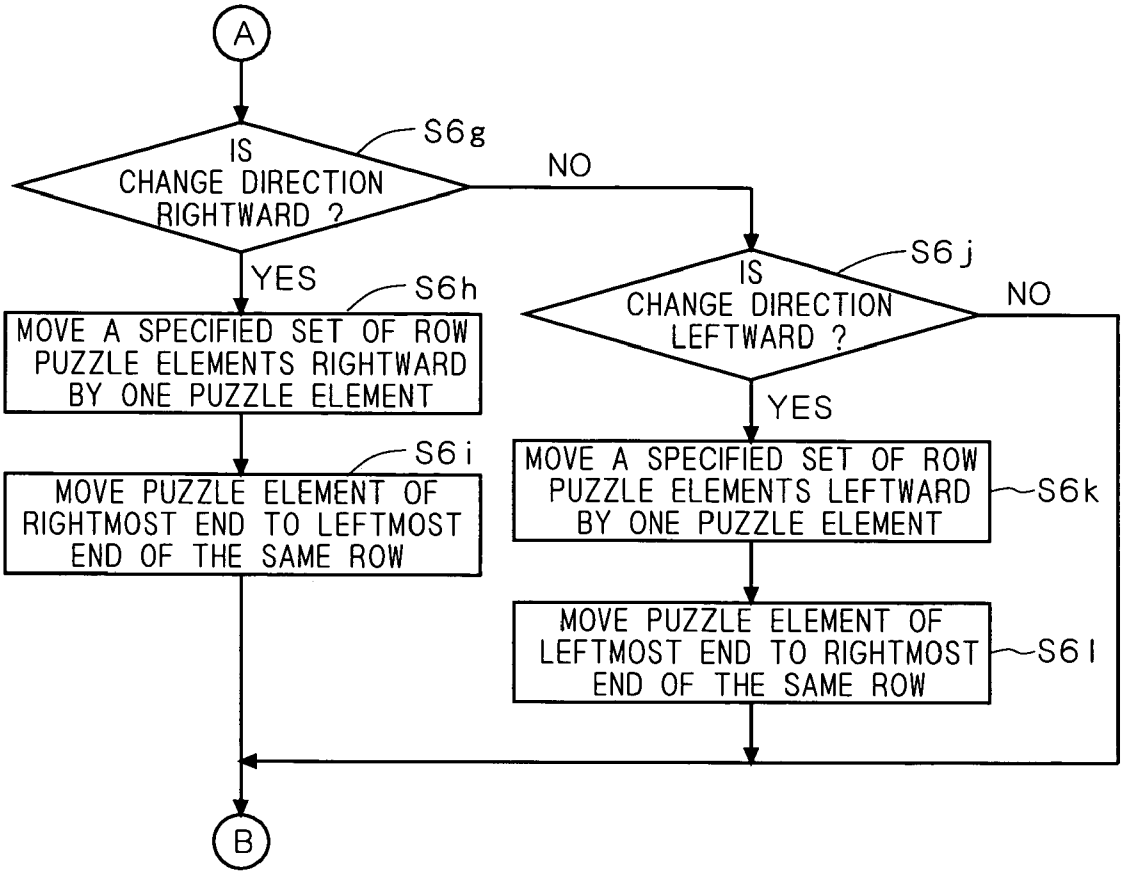

A
IS CHANGE DIRECTION RIGHTWARD ?
S6g
NO
YES
S6h
MOVE A SPECIFIED SET OF ROW PUZZLE ELEMENTS RIGHTWARD BY ONE PUZZLE ELEMENT
S6i
MOVE PUZZLE ELEMENT OF RIGHTMOST END TO LEFTMOST END OF THE SAME ROW
IS CHANGE DIRECTION LEFTWARD ?
S6j
NO
YES
MOVE A SPECIFIED SET OF ROW PUZZLE ELEMENTS LEFTWARD BY ONE PUZZLE ELEMENT
S6k
MOVE PUZZLE ELEMENT OF LEFTMOST END TO RIGHTMOST END OF THE SAME ROW
S6l
B

FIG. 20

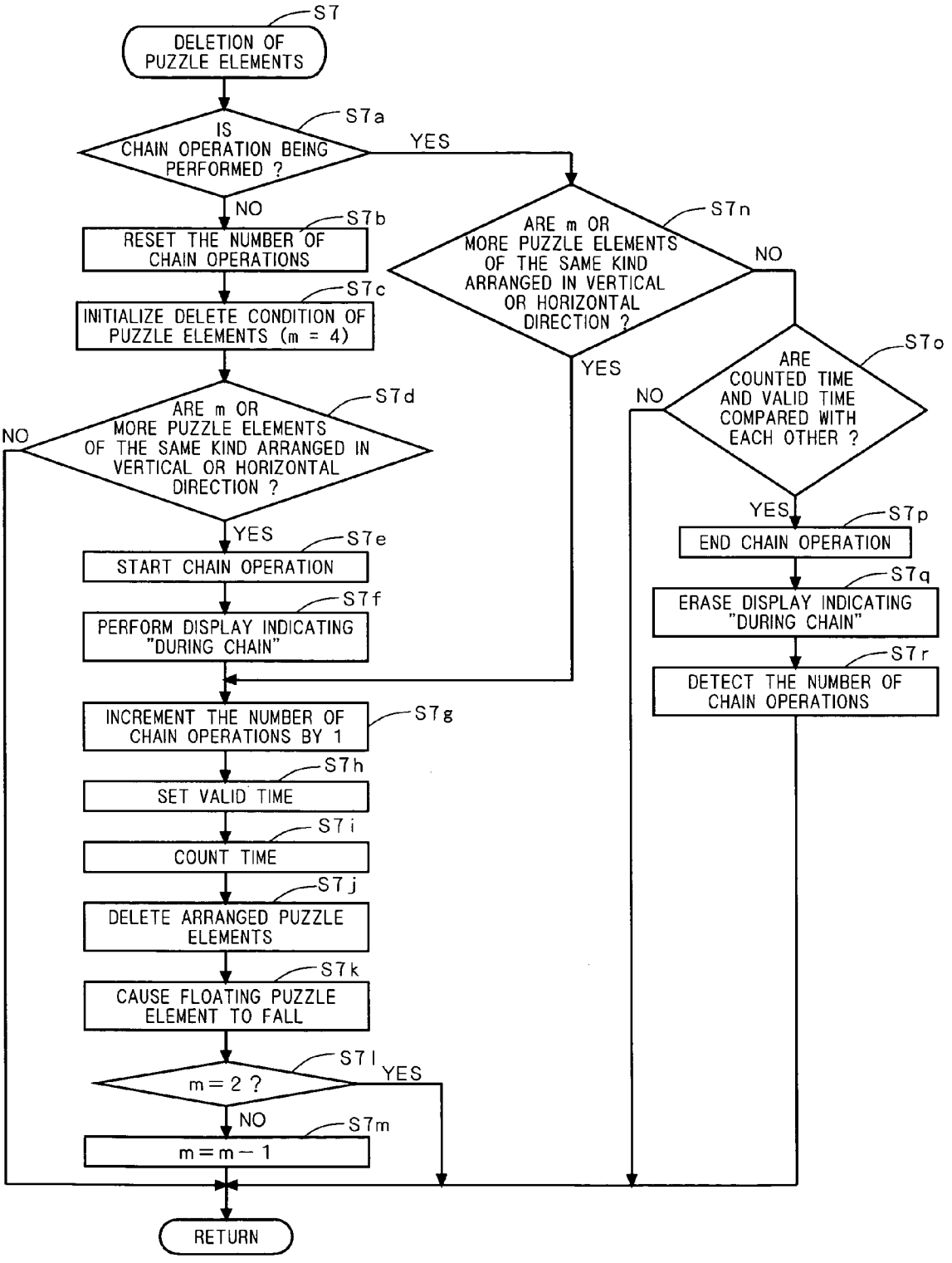

S7
DELETION OF PUZZLE ELEMENTS
S7a
IS CHAIN OPERATION BEING PERFORMED ?
YES
NO
S7b
RESET THE NUMBER OF CHAIN OPERATIONS
S7c
INITIALIZE DELETE CONDITION OF PUZZLE ELEMENTS (m = 4)
S7d
ARE m OR MORE PUZZLE ELEMENTS OF THE SAME KIND ARRANGED IN VERTICAL OR HORIZONTAL DIRECTION ?
NO
YES
S7e
START CHAIN OPERATION
S7f
PERFORM DISPLAY INDICATING "DURING CHAIN"
S7n
ARE m OR MORE PUZZLE ELEMENTS OF THE SAME KIND ARRANGED IN VERTICAL OR HORIZONTAL DIRECTION ?
NO
YES
S7o
ARE COUNTED TIME AND VALID TIME COMPARED WITH EACH OTHER ?
NO
YES
S7p
END CHAIN OPERATION
S7q
ERASE DISPLAY INDICATING "DURING CHAIN"
S7r
DETECT THE NUMBER OF CHAIN OPERATIONS
S7g
INCREMENT THE NUMBER OF CHAIN OPERATIONS BY 1
S7h
SET VALID TIME
S7i
COUNT TIME
S7j
DELETE ARRANGED PUZZLE ELEMENTS
S7k
CAUSE FLOATING PUZZLE ELEMENT TO FALL
S7l
m = 2 ?
YES
NO
S7m
m = m − 1
RETURN

FIG. 21

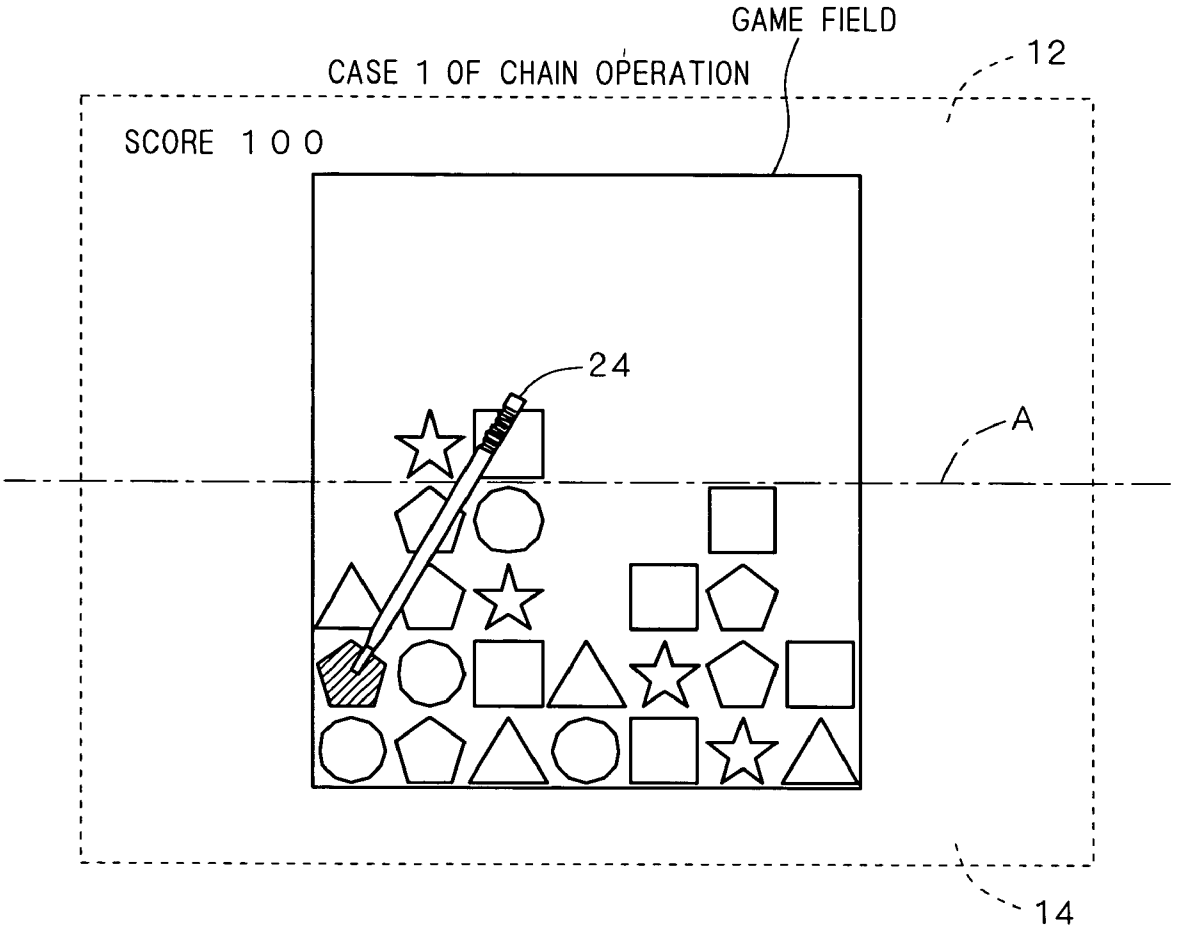


FIG. 22

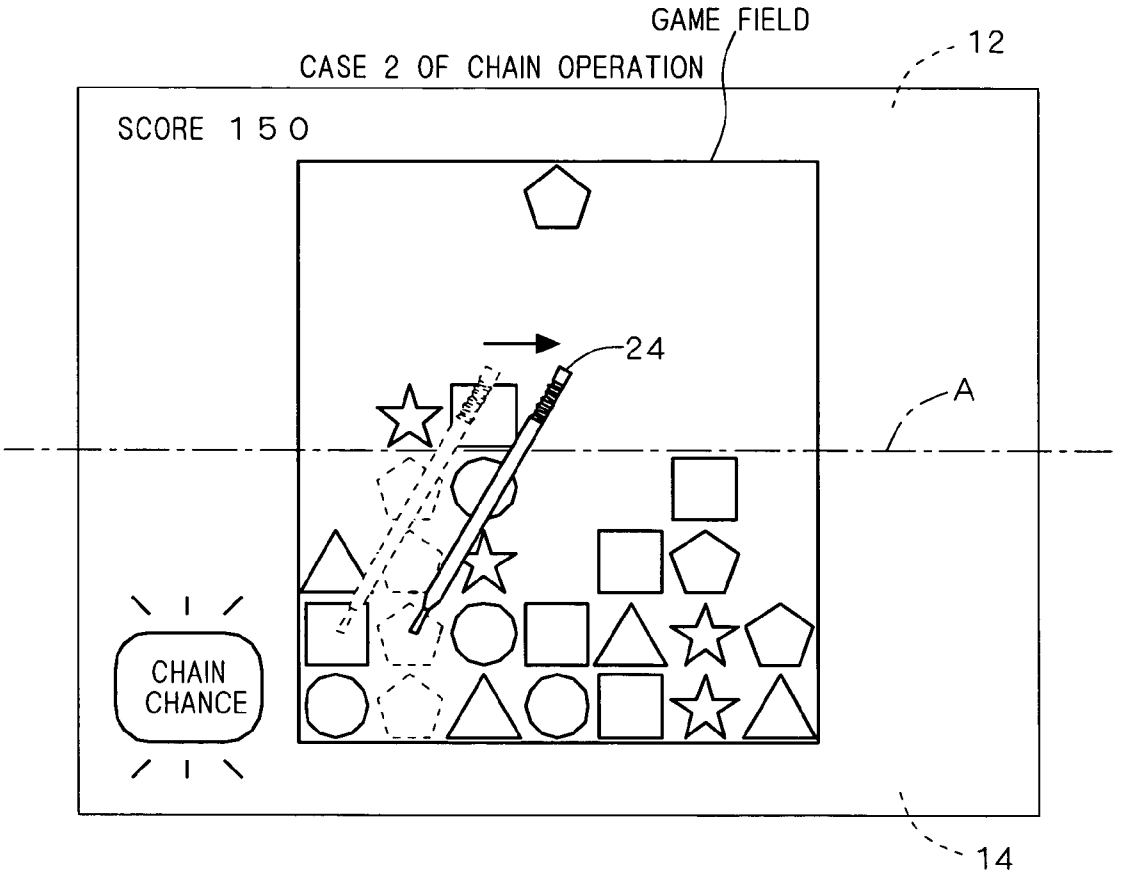

GAME FIELD
12
CASE 2 OF CHAIN OPERATION
SCORE 150
24
A
CHAIN
CHANCE
14

FIG. 23

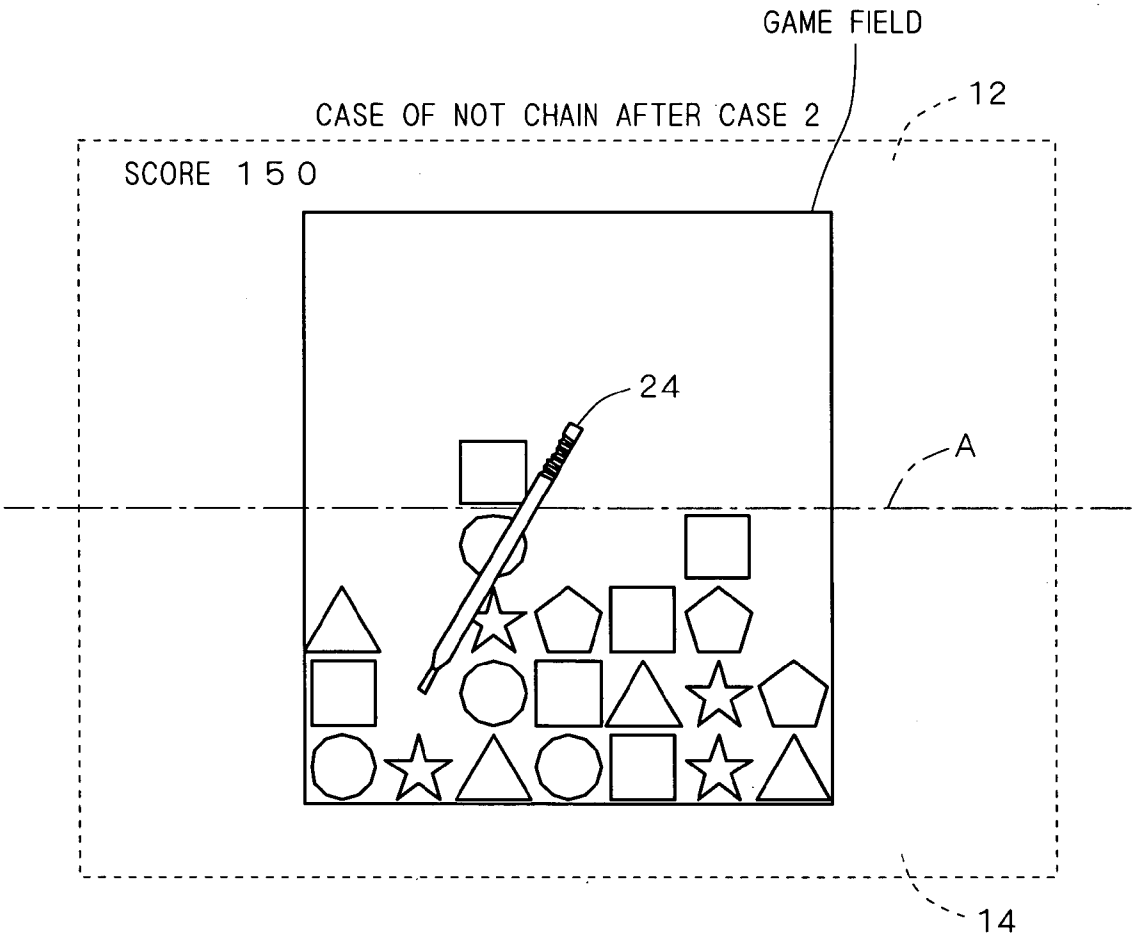


FIG. 24

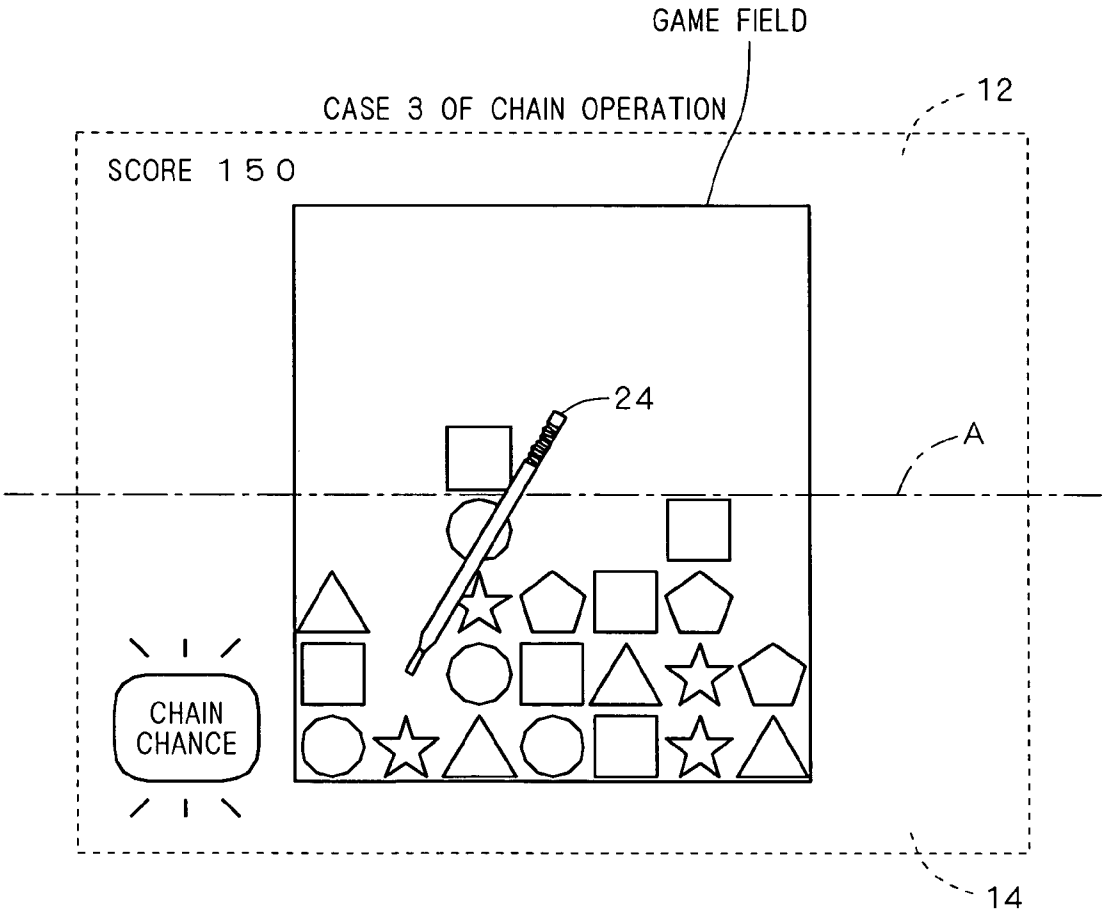

GAME FIELD
CASE 3 OF CHAIN OPERATION
12
SCORE 150
24
A
CHAIN
CHANCE
14

FIG. 25

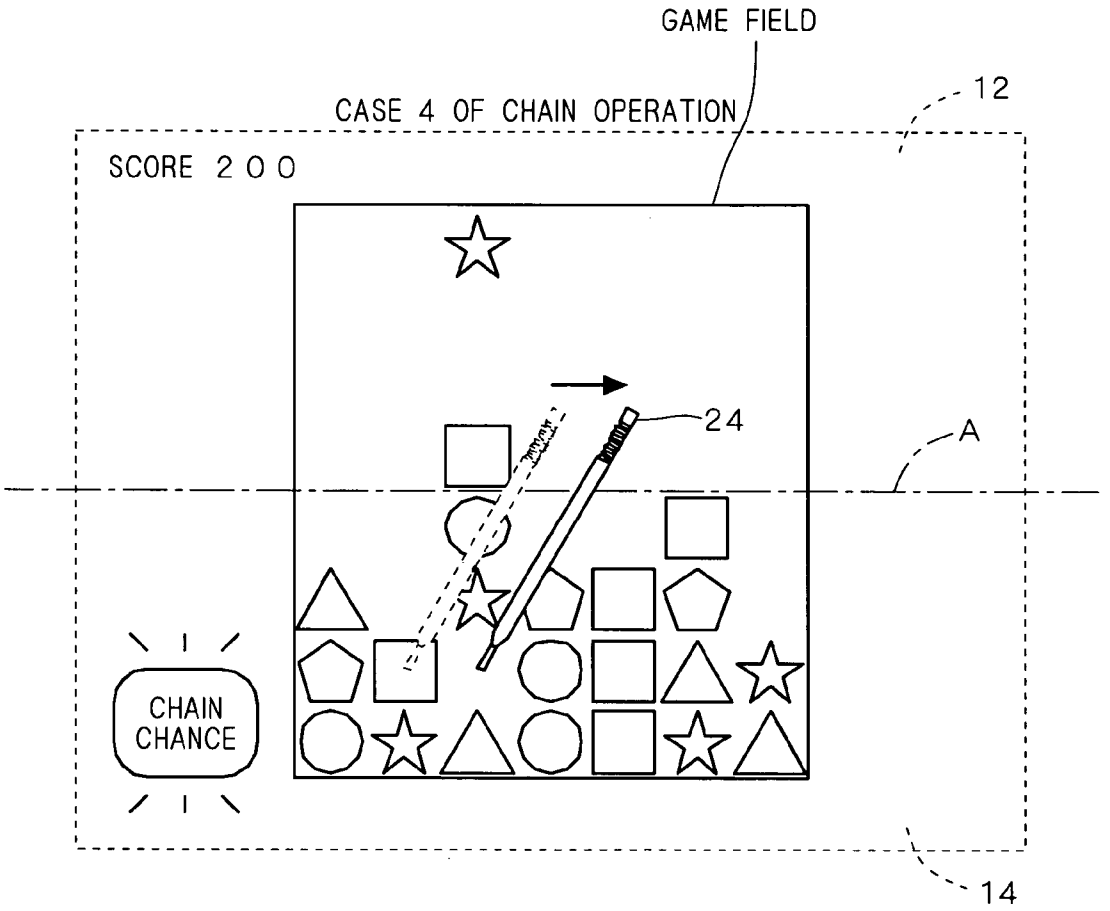

GAME FIELD
CASE 4 OF CHAIN OPERATION
12
SCORE 200
24
A
CHAIN CHANCE
14

FIG. 26

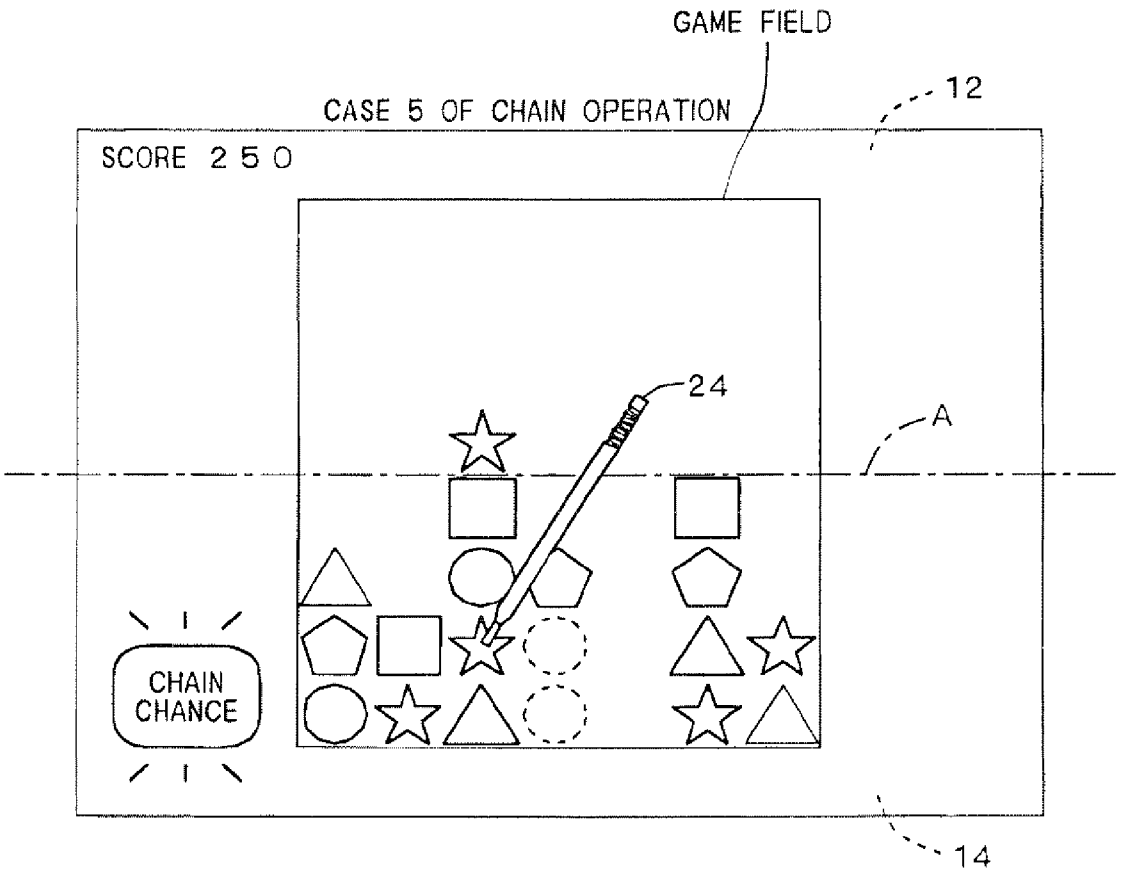

GAME FIELD
12
CASE 5 OF CHAIN OPERATION
SCORE 250
24
A
CHAIN
CHANCE
14

FIG. 27

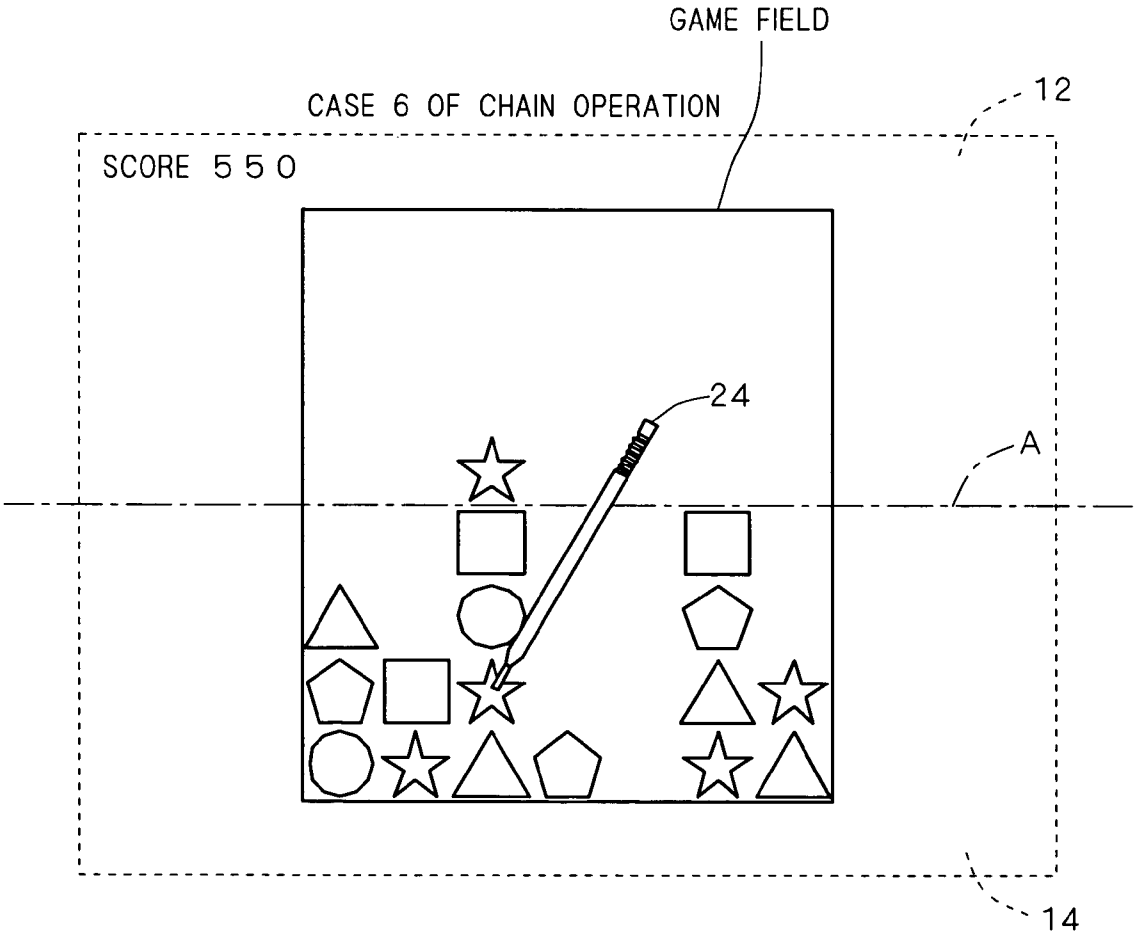


FIG. 28

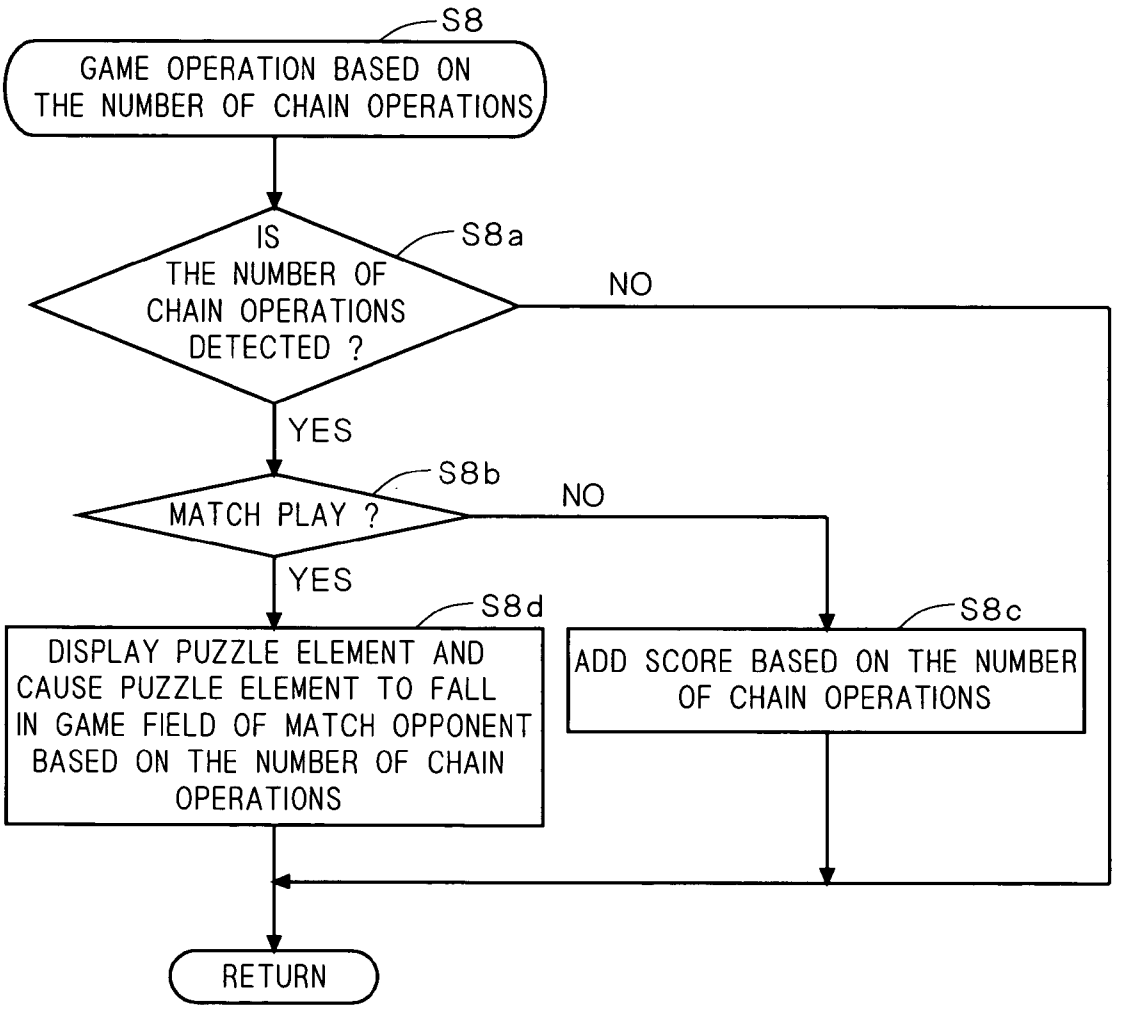

S8
GAME OPERATION BASED ON THE NUMBER OF CHAIN OPERATIONS
S8a
IS THE NUMBER OF CHAIN OPERATIONS DETECTED ?
NO
YES
S8b
MATCH PLAY ?
NO
YES
S8d
DISPLAY PUZZLE ELEMENT AND CAUSE PUZZLE ELEMENT TO FALL IN GAME FIELD OF MATCH OPPONENT BASED ON THE NUMBER OF CHAIN OPERATIONS
S8c
ADD SCORE BASED ON THE NUMBER OF CHAIN OPERATIONS
RETURN

FIG. 29

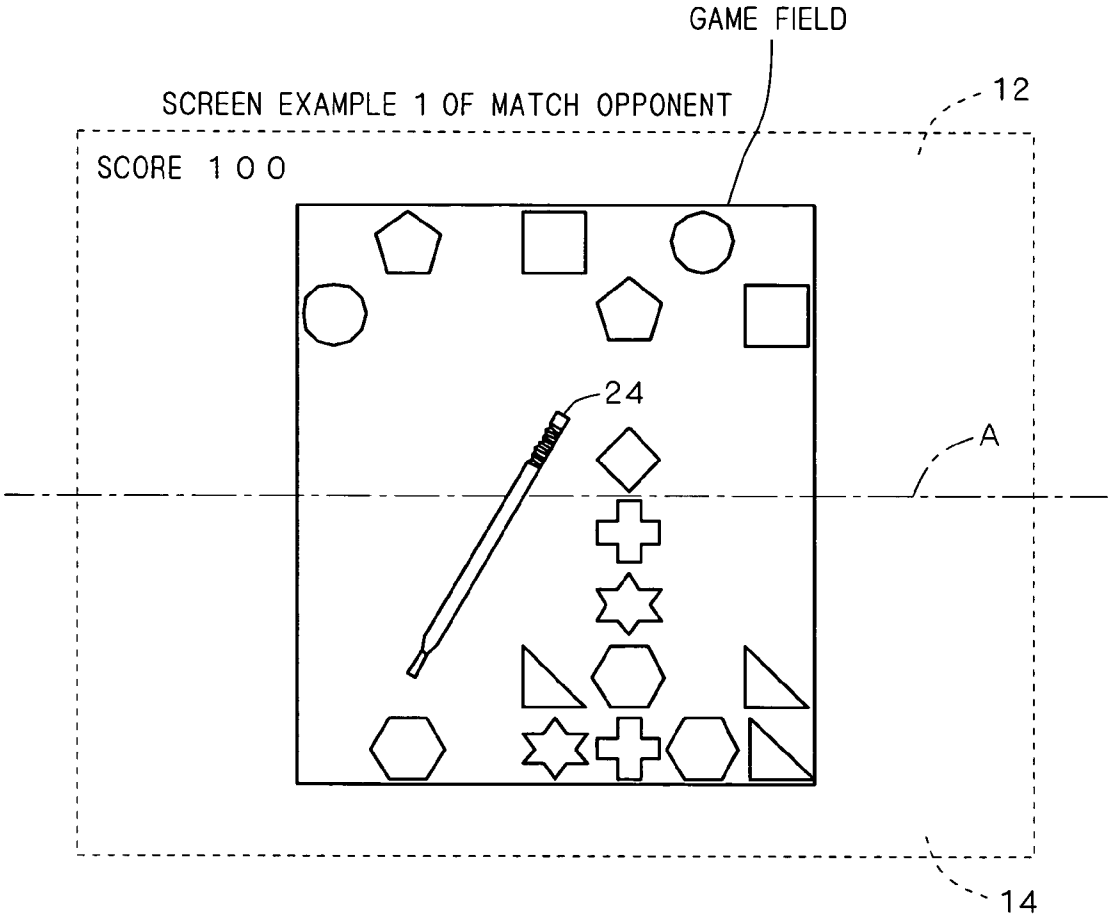
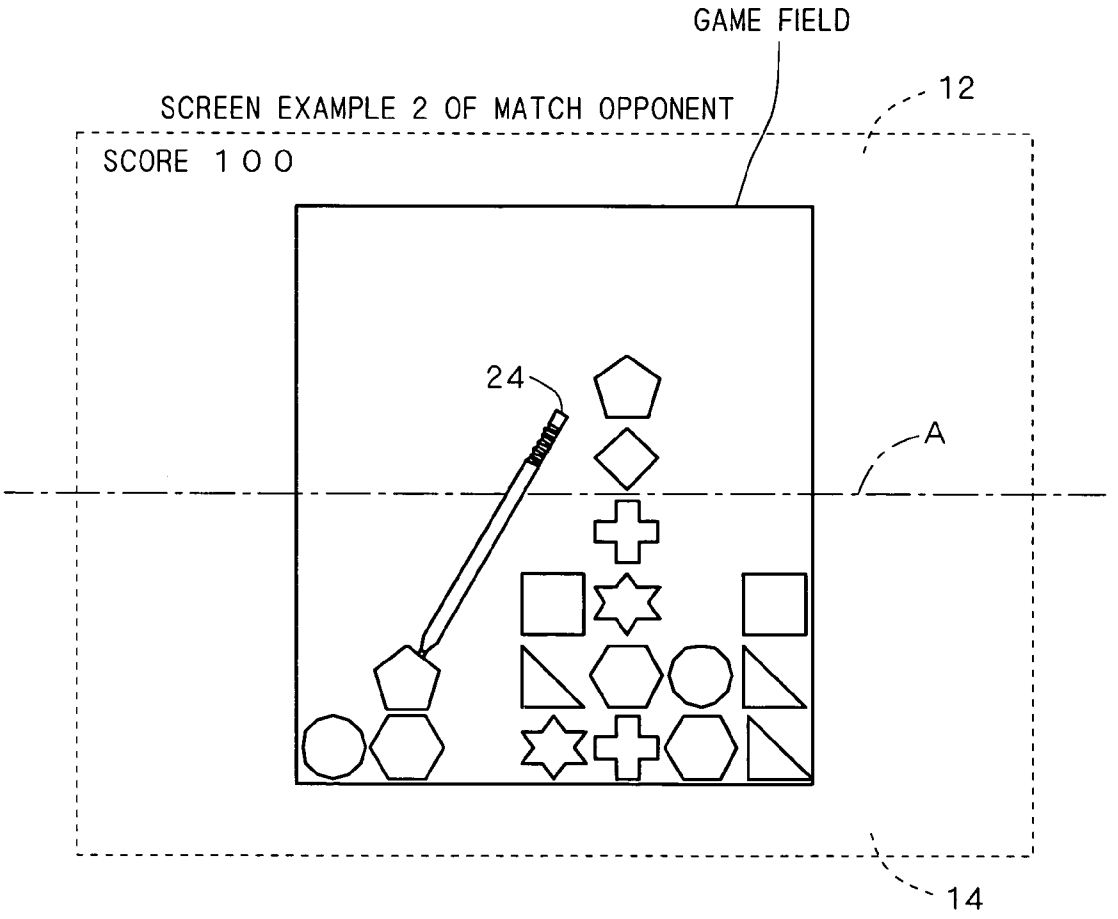

GAME FIELD
SCREEN EXAMPLE 1 OF MATCH OPPONENT
12
SCORE 100
24
A
14

FIG. 30


GAME FIELD
12
SCREEN EXAMPLE 2 OF MATCH OPPONENT
SCORE 100
24
A
14

GAME PROGRAM AND GAME DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a game program and a game device, and more particularly to a game program and a game device on a puzzle game.

2. Description of the Background Art

Among background arts are Japanese Patent Application Laid Open Gazette No. 2001-178967 and Japanese Patent Application Laid Open Gazette No. 11-226263.

The above two background arts are techniques on a puzzle game where a plurality of kinds of puzzle elements are displayed on a screen. In these techniques, assuming a condition in which a predetermined number of puzzle elements of the same kind are continuously arranged as a delete condition, a plurality of kinds of puzzle elements displayed on the screen are moved in accordance with an operation of a player and when the delete condition is satisfied, the puzzle elements satisfying the delete condition are deleted and the puzzle elements are moved downward in the screen so as to fill the space created by the deletion, and if puzzle elements satisfying the delete condition are formed by the movement, the puzzle elements are further deleted. Thus, a repeat of deletion and movement of the puzzle elements (a chain operation) is performed until there exists no puzzle element satisfying the delete condition.

In both the above two background arts, since the delete condition is always constant, there is a problem that it is hard to continue a chain operation in which deletion of the puzzle elements is repeated for a long time. Therefore, the game is hard to deal with for a beginner who is inexperienced in it. Though it is possible to set the delete condition easier in advance (for example, a condition in which two or more puzzle elements of the same kind are continuously arranged is set as the delete condition), in this case, since the delete condition can be satisfied easily, the puzzle elements are instantly deleted and it is hard to leave puzzle elements so as to continue a chain operation for a long time, and as a result, since it becomes hard to continue the chain operation, there arises a problem that the game loses its interest.

SUMMARY

In a non-limiting aspect, a game program and a game device capable of changing a delete condition of puzzle elements in accordance with the proceeding of a game are provided. In another non-limiting aspect, a game program and a game device which can easily perform a chain operation in which deletion of puzzle elements is repeated are provided.

A non-limiting illustrative example can be intended for a computer software product including a recording medium in which a computer-readable game program is recorded. The game program is used for causing a computer to perform a puzzle game in which a plurality of kinds of puzzle elements are sequentially created and displayed on display means while the layout position of the puzzle elements is changed in accordance with an operation of a player and when puzzle elements of the same kind are arranged continuously in a predetermined direction, the puzzle elements of the same kind which are continuously arranged are deleted. The game program comprises a first delete condition setting step of setting a delete condition of the puzzle elements in which puzzle elements of the same kind in a first number or more are continuously arranged in a predetermined direction as a first delete condition, a first delete condition judgment step of judging if the first delete condition is achieved in accordance with the operation of the player, a puzzle element deleting step of deleting puzzle elements satisfying the first delete condition when it is judged that the first delete condition is achieved in the first delete condition judgment step, a second delete condition setting step of setting a next delete condition of the puzzle elements in which puzzle elements of the same kind in a second number which is smaller than the first number or more are continuously arranged in a predetermined direction as a second delete condition when it is judged that the first delete condition is achieved in the first delete condition judgment step, and a second delete condition judgment step of judging if the second delete condition is achieved after the second delete condition is set. In the game program, the puzzle element deleting step deletes puzzle elements satisfying the second delete condition when it is judged that the second delete condition is achieved in the second delete condition judgment step.

When it is judged that the first delete condition is achieved, the first delete condition is changed and a next delete condition of the puzzle elements in which puzzle elements of the same kind in the second number which is smaller than the first number or more are continuously arranged in a predetermined direction is set as the second delete condition. This makes it possible to change the delete condition of puzzle elements to an easier condition in accordance with the proceeding of the game. Therefore, it is possible to easily perform a chain operation in which deletion of puzzle elements is repeated.

These and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an illustration of an overview of a game device and the like in accordance with the present invention;

FIG. **2** is a block diagram showing a constitution of the game device in accordance with the present invention;

FIG. **3** is a view illustrating a basic operation;

FIGS. **4** to **6** are views each illustrating a basic operation in a case of moving a set of puzzle elements upward;

FIGS. **7** to **9** are views each illustrating a basic operation in a case of moving a set of puzzle elements downward;

FIGS. **10** and **11** are views each illustrating a basic operation in a case of moving a set of puzzle elements rightward;

FIGS. **12** and **13** are views each illustrating a basic operation in a case of moving a set of puzzle elements leftward;

FIG. **14** is a main flowchart showing an operation flow of a game program in accordance with the present invention;

FIG. **15** is a view showing an exemplary initial screen;

FIG. **16** is a view showing a state where a puzzle element which is selected at random is created;

FIG. **17** is a sub-flowchart showing a flow of operation by a player;

FIGS. **18** and **19** are sub-flowcharts each showing an operation flow for movement of a set of puzzle elements;

FIG. **20** is a sub-flowchart showing an operation flow for deletion of the puzzle elements;

FIGS. **21** and **22** are views each illustrating a chain operation;

FIG. **23** is a view showing an exemplary case where a chain operation does not continue;

FIGS. **24** to **26** are views each illustrating a chain operation;

FIG. **27** is a view showing a state where a bonus score is added in accordance with the number of chain operations;

FIG. **28** is a sub-flowchart showing an operation flow for reflecting a predetermined effect on the proceeding of a game in accordance with the number of chain operations;

FIG. **29** is a view showing a state where puzzle elements are created in a game field of a match opponent in accordance with the number of chain operations; and

FIG. **30** is a view showing a state after the fall of the puzzle elements which are created in the game field of the match opponent.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, specific discussion on various aspect of the present invention will be presented on the basis of figures showing illustrative embodiment(s) and corresponding descriptions.

<A> Description of Game Device

Referring to FIG. **1**, a game device **10** in accordance with a preferred embodiment of the present invention includes a first liquid crystal display (LCD) **12** and a second LCD **14**. The first LCD **12** and the second LCD **14** are so accommodated in a housing **16** as to be in a predetermined layout position. In the present preferred embodiment, the housing **16** consists of an upper housing **16***a* and a lower housing **16***b*, and the first LCD **12** is accommodated in the upper housing **16***a* and the second LCD **14** is accommodated in the lower housing **16***b*. Therefore, the first LCD **12** and the second LCD **14** are arranged adjacently to each other, being vertically aligned.

Though the LCD is used as a display in this preferred embodiment, an EL (Electronic Luminescence) display may be used instead of the LCD.

As can be seen from FIG. **1**, the upper housing **16***a* has a planar shape larger than that of the first LCD **12** and an opening is formed in the upper housing **16***a* so as to expose a display surface of the first LCD **12** on one main surface thereof. On the other hand, the lower housing **16***b* has a planar shape which is almost equivalent to that of the upper housing **16***a* and an opening is formed in a substantially center portion in a horizontal direction so as to expose a display surface of the second LCD **14**. In the upper housing **16***a*, sound release holes **22***a* on the right side and sound release holes **22***b* on the left side are so formed symmetrically as to sandwich the first LCD **12**. In the housing **16**, operation switches **18** (**18***a*, **18***b*, **18***c*, **18***d*, **18***e*, **18***f*, **18***h*, **18***g*, **18**L and **18**R) are provided.

As for the positional relation between the upper housing **16***a* and the lower housing **16***b*, parts of the lower side (end) of the upper housing **16***a* and the upper side (end) of the lower housing **16***b* are connected so that the upper housing **16***a* and the lower housing **16***b* can be rotated about an axis A. Therefore, if the upper housing **16***a* is rotated to fold the housing **16** with the display surface of the first LCD **12** and the display surface of the second LCD **14** facing each other in not playing a game, it is possible to prevent the display surface of the first LCD **12** and the display surface of the second LCD **14** from being damaged, such as being scratched. The housing **16**, however, may be formed with the upper housing **16***a* and the lower housing **16***b* united (fixed to each other) instead of being connected rotatably.

The operation switches **18** include a directional indicator switch (cross switch) **18***a*, a start switch **18***b*, a select switch **18***c*, an action switch (A button) **18***d*, an action switch (B button) **18***e*, an action switch (X button) **18***f*, an action switch (Y button) **18***g*, a power supply switch **18***h*, an action switch (L button) **18**L and an action switch (R button) **18**R. The switches **18***a* and **18***h* are positioned on the left side of the second LCD **14** in one main surface of the lower housing **16***b*. The switches **18***b* to **18***g* are positioned on the right side of the second LCD **14** in the same one main surface of the lower housing **16***b*. The switches **18**L and **18**R are positioned in parts of upper end (top portion) of the lower housing **16***b* other than the connection with the upper housing **16***a*, on the left and right sides, so as to sandwich the connection.

The directional indicator switch **18***a* functions as a digital joy stick and is used to indicate a moving direction of a player character (or player object) which is operated by a player, indicate a moving direction of a cursor or the like, by manipulating one of four press portions. The start switch **18***b* is formed of a push button and used to start (restart) a game, pause the game or the like. The select switch **18***c* is formed of a push button and used to select a game mode or the like.

The action switch **18***d*, i.e., the A button is formed of a push button and used to perform actions other than directional indication, i.e., cause the player character to make any actions such as punching, throwing, catching, riding on something, jumping or the like. In an action game, for example, this action switch **18***d* can give instructions to jump, punch, operate a weapon, or the like. In a role playing game (RPG) or a simulation RPG, the action switch **18***d* can give instructions to catch items, select and decide a weapon or a command, or the like. The action switch **18***e*, i.e., the B button is formed of a push button and used to change the game mode selected with the select switch **18***c*, cancel the action decided with the A button **18***d*, or the like.

The action switch **18***f*, i.e., the X button and the action switch **18***g*, i.e., the Y button are each formed of a push button and each serve as an auxiliary operation button when the proceeding of the game can not be performed by only the push buttons A and B. It is natural that the X button and the Y button do not necessarily have to be used in game play. The power supply switch **18***h* is a switch to turn on and off the power supply of the game device **10**.

The action switch **18**L (left push button) and the action switch **18**R (right push button) are each formed of a push button, and the left push button (L button) **18**L and the right push button (R button) **18**R are used to perform the same operations as the A button **18***d* and the B button **18***e* or auxiliary operations for the A button **18***d* and the B button **18***e*, respectively.

The game device **10** is a game device using a touch panel, and onto an upper surface of the second LCD **14**, a touch panel **20** is attached in association with the second LCD **14**. As the touch panel **20**, for example, any one of resistance film type, optical type (infrared type) and capacitive coupling type may be used. In the touch panel **20**, its upper surface is manipulated, such as pushed or stroked (touched), with a stick **24**, a pen (stylus pen) or fingers (hereinafter, sometimes referred to as "stick **24** or the like") and the coordinate position of the stick **24** or the like is thereby detected to output coordinate data.

In this preferred embodiment, the resolution of the display surface of the second LCD **14** is 228 dots×192 dots (the same or almost the same) applies to the first LCD **12**) and the detection accuracy of the touch panel **20** is also 228 dots×192 dots correspondingly to the display screen, but the detection accuracy of the touch panel **20** may be higher or lower than the resolution of the display screen.

In playing a certain type of game, for example, on the second LCD **14** provided with the touch panel **20**, a game screen which is watched and manipulated by a player is displayed, and on the first LCD **12**, a game screen which is watched by the player is displayed. Specifically, on the first

LCD **12**, an image in which an object moves on orbits formed of vertical and horizontal lines is displayed. In the game screen on the second LCD **14**, only vertical lines are displayed and the player manipulates the touch panel **20** with the stick **24** or the like, directly touching it, so as to draw horizontal lines thereon with respect to the vertical lines displayed on the second LCD **14**. Then, the player draws the continuance of the orbits of the first LCD **12** on the second LCD **14** and thereby creates an orbit to guide the moving object to a predetermined position. Further, in the second LCD **14**, various kinds of input instructions in accordance with the type of game may be performed. For example, text information, icons or the like may be displayed on the display screen of the second LCD **14** to allow the player to select a command.

Thus, since the game device **10** has the first LCD **12** and the second LCD **14** which serve as a two-screen display unit and the touch panel **20** is provided on either of these LCDs (in this preferred embodiment, on the second LCD **14**), the game device **10** has a constitution of two screens (LCDs **12** and **14**) and two-system operation units (**18** and **20**).

Further, in this preferred embodiment, the stick **24** can be accommodated in a storage unit (storage hole) (not shown) provided, e.g., on one side (right side) portion of the upper housing **16***a* and taken out as necessary. If no stick **24** is provided, it is not necessary to provide the storage unit.

Furthermore, the game device **10** includes a memory card (or game cartridge) **26**, and the memory card **26** is removable and is inserted in from an insert port (not shown) provided on a back side or an upper end (of the side surface) of the lower housing **16***b*. Though not shown in FIG. **1**, in a recess of the insert port, a connector **46** (see FIG. **2**) to be connected with a connector (not shown) provided on a top portion of the memory card **26** in the direction of insertion, and when the memory card **26** is inserted into the insert port, these connectors are connected to each other to thereby allow a CPU core **42** (see FIG. **2**) of the game device **10** to access the memory card **26**.

Though not illustrated in FIG. **1**, inside the lower housing **16***b*, a right speaker **30***a* (see FIG. **2**) is provided in a position corresponding to the sound release holes **22***a* of the lower housing **16***b* and a left speaker **30***b* is provided in a position corresponding to the sound release holes **22***b*.

Though not shown in FIG. **1**, for example, a battery housing box is provided on the back side of the lower housing **16***b*, and a volume controller (control knob), an external extension connector, an earphone jack and the like are provided on a bottom side of the lower housing **16***b*.

FIG. **2** is a block diagram showing an electric constitution of the game device **10**. Referring to FIG. **2**, the game device **10** includes an electronic circuit board **40**, and on the electronic circuit board **40**, circuit components such as the CPU core **42** and the like are mounted. The CPU core **42** is connected to the connector **46**, a RAM **48**, a first GPU (Graphic Processing Unit) **52**, a second GPU **54**, an I/F circuit **50**, an LCD controller **60** and a wireless communication unit **64** through a bus **44**.

As discussed above, to the connector **46**, the memory card **26** is connected removably. The memory card **26** includes a ROM **26***a* and a RAM **26***b*. Though not shown, the ROM **26***a* and the RAM **26***b* are connected to each other with a bus and both connected to a connector (not shown) which is connected to the connector **46**. As a result, the CPU core **42** can access the ROM **26***a* and the RAM **26***b*.

The ROM **26***a* stores a game program for a game to be performed by the game device **10**, image data such as a character image, a background image, an item image and a message image and sound data such as a sound effect, a BGM and an imitative sound of the character in advance. The backup RAM **26***b* saves intermediate data and result data of the game.

The RAM **48** is used as a buffer memory or a working memory. In other words, the CPU core **42** loads the game program and the data such as the image data, the sound data and the like, which are stored in the ROM **26***a* of the memory card **26**, on the RAM **48** and executes the loaded game program. The CPU core **42** stores temporary data such as game data and flag data in accordance with the proceeding of the game in the RAM **48**.

The game program and the data such as the image data, the sound data and the like are collectively or partially and subsequently, as necessary, read out from the ROM **26***a* and stored in the RAM **48**.

Each of the GPUs **52** and **54** forms part of drawing means and is formed of, e.g., a single-chip ASIC. When the GPU **52** or **54** receives a graphics command (drawing command) from the CPU core **42**, the GPU generates game image data in accordance with this graphics command. In this case, the CPU core **42** gives an image generation program (included in the game program) needed for generating the game image data, in addition to the graphics command, to each of the GPUs **52** and **54**.

The data (image data such as polygon, texture or the like) needed for executing the graphics command is stored in the RAM **48** and acquired by the GPU **52** or **54**.

A first VRAM **56** is connected to the first GPU **52** and a second VRAM **58** is connected to the second GPU **54**. The first GPU **52** draws the generated game image data in the first VRAM **56** and the second GPU **54** draws the generated game image data in the second VRAM **58**.

The VRAMs **56** and **58** are connected to the LCD controller **60**. The LCD controller **60** includes a register **62**. The register **62** is formed of, e.g., one bit and stores a data value of "0" or "1" in accordance with the instruction of the CPU core **42**. When the data value of the register **62** is "0", the LCD controller **60** outputs the game image data drawn in the first VRAM **56** to the second LCD **14** and outputs the game image data drawn in the second VRAM **58** to the first LCD **12**. When the data value of the register **62** is "1", the LCD controller **60** outputs the game image data drawn in the first VRAM **56** to the first LCD **12** and outputs the game image data drawn in the second VRAM **58** to the second LCD **14**.

To the I/F circuit **50**, the operation switches **18**, the touch panel **20**, the right speaker **30***a* and the left speaker **30***b* are connected. In this case, the operation switches **18** include the above-described switches **18***a*, **18***b*, **18***c*, **18***d*, **18***e*, **18***f*, **18***g*, **18***h*, **18**L and **18**R. When any of the operation switches **18** is manipulated, a corresponding operation signal (operation data) is inputted to the CPU core **42** through the I/F circuit **50**. The coordinate data detected in the touch panel **20** is also inputted to the CPU core **42** through the I/F circuit **50**. Further, the CPU core **42** reads out the sound data such as the BGM, the sound effect, the imitative sound of the character and the like, which is needed for the game, from the ROM **48** and outputs the sound data through the I/F circuit **50** from the right speaker **30***a* and the left speaker **30***b*.

In a state where a two-player mode (match play mode) is selected, a radio signal is transmitted to/from a game device of a match opponent through the wireless communication unit **64**. Specifically, the wireless communication unit **64** modulates communication data for the match opponent into a radio signal and sends it from an antenna (not shown) and receives a radio signal from the game device of the match opponent by the same antenna and demodulates it into communication data.

<B> Game Program

<B-1> General Outline of Game Program

A game program in accordance with the present invention causes a computer such as the above-described game device **10** or the like to perform a puzzle game.

A manner to install the game program in the computer may be any one of well-known manners. In the case of FIG. **2**, the game program is stored in the memory card **26** and read out on the game device **10** therefrom. The CPU core **42** operates in accordance with the procedure prescribed by the game program to execute such process steps as discussed below on the game device **10**.

In other words, the CPU core **42** is provided with specific functions by the game program and the game device **10** thereby comprises function means which are organically connected to execute the steps on the computer.

Hereinafter, taking a case of using the game device **10** as an example, the game program of the present invention will be described in detail.

In the game program of the present invention, a plurality of kinds of puzzle elements are sequentially created and displayed on the LCDs **12** and **14** (display means) shown in FIGS. **1** and **2**. This will be discussed later in <B-3>.

Further, the layout position of the puzzle elements is changed in accordance with the operation of the player. This will be discussed later in <B-2> and <B-4>.

When puzzle elements of the same kind are continuously arranged in a predetermined direction, the puzzle elements of the same kind which are continuously arranged are deleted. Further, in the game program of the present invention, a delete condition of the puzzle elements is changed in accordance with the proceeding of the game. This will be discussed later in <B-5>.

The delete condition is defined as a condition in which puzzle elements of the same kind in a predetermined number or more are continuously arranged in a predetermined direction. Then, by reducing the predetermined number, the delete condition is changed. Therefore, the predetermined number restricting the delete condition after the change is smaller than the predetermined number restricting the delete condition before the change.

In the following discussion, simply-mentioned "predetermined number" refers to the number which restricts the delete condition of puzzle elements as discussed above.

<B-2> Change of Layout Position of Puzzle Elements (1)

Prior to specific discussion on the game program, first, a basic movement of puzzle elements in the present game will be described.

First, an upward movement of the puzzle elements (or a set of puzzle elements discussed later) will be described.

In FIG. **3**, across the first LCD **12** and the second LCD **14**, a plurality of and a plurality of kinds of puzzle elements are displayed inside a game field. In such a state, the stick **24** is brought into contact with a hatched puzzle element as shown in FIG. **4**. Then, as shown in FIG. **5**, the stick **24** is slidingly moved upward in this figure. At this time, a set of puzzle elements arranged in a vertical direction (column direction) to which the hatched puzzle element belongs are moved upward as a unit. Herein, in the case of upward movement, the state of FIG. **5** is kept for a certain time period and after that, the set of puzzle elements are so moved downward as to eliminate the space in the lower portion of the second LCD **14**, as shown in FIG. **6**.

In the present preferred embodiment, in the case of upward movement adopted is a manner in which a set of puzzle elements fall after a certain time period as discussed above. As another manner, however, there may be a case where a set of puzzle elements are kept at the position after the upward movement, instead of falling.

Further, in this preferred embodiment, it is assumed that there are puzzle elements which satisfy a delete condition discussed later during a period while a set of puzzle elements are moved upward and fall. In such a case, the puzzle elements satisfying the delete condition are to be deleted.

Next, a downward movement of the puzzle elements (or a set of puzzle elements discussed later) will be described.

In the state of FIG. **3**, the stick **24** is brought into contact with a hatched puzzle element as shown in FIG. **7**. Then, as shown in FIG. **8**, the stick **24** is slidingly moved downward in this figure. At this time, a set of puzzle elements arranged in a vertical direction (column direction) to which the hatched puzzle element belongs are moved downward as a unit. In this case, the lowest one of the set of puzzle elements in FIG. **7** (a puzzle element of triangle in FIG. **7**) is redisplayed on the highest stage of the same column through the downward movement as can be seen in FIG. **8**. After that, as shown in FIG. **9**, the redisplayed puzzle element falls toward the set of puzzle elements.

Next, a rightward movement of the puzzle elements (or a set of puzzle elements discussed later) will be described.

In the state of FIG. **3**, the stick **24** is brought into contact with a portion of no puzzle element as shown in FIG. **10**. Then, as shown in FIG. **11**, the stick **24** is slidingly moved rightward in this figure. At this time, a set of puzzle elements arranged in a horizontal direction (row direction) to which the contact portion belongs are moved rightward as a unit. In this case, the rightmost one of the set of puzzle elements (a puzzle element of square in FIG. **10**) is redisplayed on the leftmost end of the same row through the rightward movement as can be seen in FIG. **11**.

Next, a leftward movement of the puzzle elements (or a set of puzzle elements discussed later) will be described.

In the state of FIG. **3**, the stick **24** is brought into contact with a portion of no puzzle element as shown in FIG. **12**. Then, as shown in FIG. **13**, the stick **24** is slidingly moved leftward in this figure. At this time, a set of puzzle elements arranged in a horizontal direction (row direction) to which the contact portion belongs are moved leftward as a unit. In this case, the leftmost one of the set of puzzle elements (a puzzle element of pentagon in FIG. **12**) is redisplayed on the rightmost end of the same row through the leftward movement as can be seen in FIG. **13**.

Herein, in each of the above movements, by one movement operation, a set of puzzle elements are moved by one puzzle element regardless of the distance of movement of the stick **24**. As another preferred embodiment, however, a movement distance of the set of puzzle elements (the number of puzzle elements to be moved) may be changed in accordance with the distance of movement of the stick **24**.

<B-3> Creation and Display of Puzzle Elements

Next, discussion on the details of the puzzle game to be performed by the game program will be presented using a flowchart. FIG. **14** is a main flowchart showing an illustrative non-limiting operation flow of the game program discussed above.

Herein, an image is displayed on the LCDs **12** and **14** at a predetermined frame rate. Then, the main flowchart of FIG. **14** is executed repeatedly, for example, by the image frame (frame by frame).

As discussed above, under the control of the GPUs **52** and **54** controlled by the CPU core **42**, image data is generated and the generated image data is temporarily stored in the VRAMs **56** and **58**. Then, the image data stored in the VRAMs **56** and

58 is read out by the LCD controller 60 and displayed as an actual image on the LCDs 12 and 14.

In FIG. 14, when the memory card (game cartridge) 26 is inserted in the game device 10 and the power of the game device 10 is turned on, the puzzle game starts.

Then, as shown in FIG. 15, the initial screen is displayed on each of the LCDs 12 and 14. Specifically, first, some puzzle elements are displayed on the LCDs 12 and 14 (on only the second LCD 14 in FIG. 15) in a predetermined layout (Step S1).

Next, the CPU core 42 selects any one of a plurality of kinds of puzzle elements at random (Step S2). Then, as shown in FIG. 16, the selected puzzle element (the puzzle element of triangle in FIG. 16) is displayed (or created) at the highest position of any column in the game field (Step S3). Under the control of the CPU core 42 and the like, the created puzzle element is caused to fall downward in the figure (Step S4).

This fall movement is continuously performed until the created puzzle element gets on the puzzle element which is present in the falling direction or the created puzzle element reaches the lowest stage of the second LCD 14.

As time passes, a puzzle element is created one by one in the above-discussed manner.

As another preferred embodiment, instead of the creation of the puzzle elements in the above-discussed Steps S2 to S4, a new set of puzzle elements may rise from the lowest position of the game field. In other words, there may be a case where as time passes, all the puzzle elements (e.g., in one frame) displayed in the game field are moved upward by one puzzle element and in a row at the lowest position of the game field which becomes vacant by the movement of the puzzle elements, a set of puzzle elements which are selected at random are newly created (displayed).

Further, the puzzle elements of predetermined kinds in a predetermined number are stocked in the RAM 48. Then, among the stocked puzzle elements, the above-discussed selection and creation of puzzle elements are performed.

Each time when the puzzle element is created in the game field, the stocked puzzle elements are reduced. If the stocked puzzle elements are all lost by sequentially creating the puzzle elements, the present stage of the game is cleared.

Furthermore, it is assumed that a stack of puzzle elements in a column reaches the highest stage of the first LCD 12. In this case, the above-discussed creation of puzzle elements is performed from one of the other columns. In other words, the above-discussed creation of puzzle elements is not performed from the column in which the stack of puzzle elements reaches the highest stage of the first LCD 12.

As discussed later, in all the columns, when stacks of puzzle elements reach the highest stage of the first LCD 12, the game is ended. Further, in a match play mode, when the stacks of puzzle elements in all the columns of the game field of either one player reach the highest stage of the first LCD 12, the game is ended.

<B-4> Change of Layout Position of Puzzle Elements (2)

Next, the CPU core 42 detects if the player performs any manipulation in the touch panel 20 (Step S5). When the stick 24 is brought into contact with the touch panel 20, the CPU core 42 detects a signal relating to the contact through the I/F circuit 50.

Herein, the details of Step S5 will be discussed, referring to the sub-flowchart of FIG. 17.

First, the CPU core 42 judges if there is any input to the touch panel 20 (i.e., the contact of the stick 24) (Step S5*a*).

If the CPU core 42 judges that there is no input ("NO" in Step S5*a*), through returning, the process goes to Step S6 of FIG. 14. On the other hand, if the CPU core 42 judges that there is an input ("YES" in Step S5*a*), the CPU core 42 detects the coordinates of the position of input (i.e., the contact position of the stick 24) in the touch panel 20 (Step S5*b*).

Next, the CPU core 42 judges if there is any input to the touch panel 20 by the stick 24 previous to this input of the stick 24 (in the previous frame) (Step S5*c*).

If the CPU core 42 judges that there is no previous input ("NO" in Step S5*c*), the CPU core 42 specifies sets of puzzle elements which are arranged in the vertical (column) and horizontal (row) directions with respect to this position coordinates detected in Step S5*b* (hereinafter, referred to as "a set of column puzzle elements" and "a set of row puzzle elements") (Step S5*d*). Then, the CPU core 42 stores the specified sets of puzzle elements into the RAM 48. After that, through returning, the process goes to Step S6 of FIG. 14.

On the other hand, if the CPU core 42 judges that there is a previous input ("YES" in Step S5*c*), the CPU core 42 further judges if the input coordinates continuously change between the previous input and the present input (Step S5*e*).

If the CPU core 42 judges that the input coordinates do not continuously change ("NO" in Step S5*e*), through returning, the process goes to Step S6 of FIG. 14. On the other hand, if the CPU core 42 judges that the input coordinates continuously change ("YES" in Step S5*e*), the CPU core 42 detects the direction of change of the input coordinates (Step S5*f*). Specifically, assuming that the coordinate in the horizontal direction is x and that in the vertical direction is y, by comparing the value of input coordinates (x1, y1) of the previous input with the value of the input coordinates (x2, y2) which are the presently detected, it is detected which direction the input coordinates change, i.e., upward, downward, rightward or leftward. Then, the CPU core 42 stores the detected change direction of the input coordinates in the RAM 48. In Step S5*f*, there may be a case where the change direction is detected only if the amount of change in the input coordinates is equal to a predetermined value or more. With this operation, even if there is a change in the input coordinates which is not intended by the player and caused by hand vibration or the like, since detection of the change direction is not performed if the amount of change is smaller than the predetermined value, it is possible to prevent any misoperation. After that, through returning, the process goes to Step S6 of FIG. 14.

After the operation of Step S5, the CPU core 42 starts movement of a set of puzzle elements as a unit (Step S6). This operation will be discussed in detail, referring to the sub-flowcharts of FIGS. 18 and 19.

In FIG. 18, the CPU core 42 makes reference to the RAM 48. The CPU core 42 thereby judges if the change direction in the input coordinates is detected, as discussed in Step S5*f* (Step S6*a*).

If the CPU core 42 judges that the change direction in the input coordinates is not detected ("NO" in Step S6*a*), through returning, the process goes to Step S7 of FIG. 14. On the other hand, if the CPU core 42 judges that the change direction in the input coordinates is detected ("YES" in Step S6*a*), the CPU core 42 judges if the detected direction is upward (Step S6*b*).

If the CPU core 42 judges that the detected direction is upward ("YES" in Step S6*b*), the CPU core 42 reads out a set of column puzzle elements among the set of puzzle elements specified in Step S5*d*, from the RAM 48. Then, the CPU core 42 moves the set of column puzzle elements upward as a unit by one puzzle element in the presently-displayed puzzle layout (Step S6*c*). Herein, the details of this movement are such as discussed in <B-2>.

Further, as discussed in <B-2>, the upward movement of the set of column puzzle elements is kept for a certain time period and after that, the set of column puzzle elements fall downward.

After that, through returning, the process goes to Step S7 of FIG. **14**.

On the other hand, if the CPU core **42** judges that the detected direction is not upward ("NO" in Step S6*b*), the CPU core **42** next judges if the detected direction is downward (Step S6*d*).

Then, if the CPU core **42** judges that the direction detected in Step S5*f* is not downward ("NO" in Step S6*d*), the process goes to Step S6*g* of FIG. **19**.

On the other hand, if the CPU core **42** judges that the detected direction is downward ("YES" in Step S6*d*), the CPU core **42** reads out a set of column puzzle elements among the set of puzzle elements specified in Step S5*d*, from the RAM **48**. Then, the CPU core **42** moves the set of column puzzle elements downward as a unit by one puzzle element in the presently-displayed puzzle layout (Step S6*e*). Herein, the details of this movement are such as discussed in <B-2>.

Herein, as discussed in <B-2>, under the control of the CPU core **42** and the like, the puzzle element displayed at the lowest stage in the set of column puzzle elements before the downward movement is redisplayed at the highest stage of the same column in the first LCD **12** through this downward movement (Step S6*f*).

After that, under the control of the CPU core **42** and the like, the redisplayed puzzle element is caused to fall on the puzzle element at the highest stage in the set of column puzzle elements (Step S6*f*).

After that, through returning, the process goes to Step S7 of FIG. **14**.

If it is judged "NO" in Step S6*d*, the CPU core **42** next judges if the direction detected in Step S5*f* is rightward (Step S6*g*).

If it is judged that the detected direction is rightward ("YES" in Step S6*g*), the CPU core **42** reads out a set of row puzzle elements among the set of puzzle elements specified in Step S5*d*, from the RAM **48**. Then, the CPU core **42** moves the set of row puzzle elements rightward as a unit by one puzzle element in the presently-displayed puzzle layout (Step S6*h*). Herein, the details of this movement are such as discussed in <B-2>.

Herein, as discussed in <B-2>, under the control of the CPU core **42**, the puzzle element displayed at the rightmost end in the set of row puzzle elements before this movement is redisplayed at the leftmost end of the same row through this rightward movement (Step S6*i*).

After that, through returning, the process goes to Step S7 of FIG. **14**.

On the other hand, if the CPU core **42** judges that the detected direction is not rightward ("NO" in Step S6*g*), the CPU core **42** next judges if the detected direction is leftward (Step S6*j*).

If it is judged that the direction detected in Step S5*f* is not leftward ("NO" in Step S6*j*), after that, through returning, the process goes to Step S7 of FIG. **14**.

On the other hand, if it is judged that the detected direction is leftward ("YES" in Step S6*j*), the CPU core **42** reads out a set of row puzzle elements among the set of puzzle elements specified in Step S5*d*, from the RAM **48**. Then, the CPU core **42** moves the set of row puzzle elements leftward as a unit by one puzzle element in the presently-displayed puzzle layout (Step S6*k*). Herein, the details of this movement are such as discussed in <B-2>.

Herein, as discussed in <B-2>, under the control of the CPU core **42**, the puzzle element displayed at the leftmost end in the set of row puzzle elements before this movement is redisplayed at the rightmost end of the same row through this leftward movement (Step S61).

After that, through returning, the process goes to Step S7 of FIG. **14**.

<B-5> Deletion of Puzzle Elements and Change of Delete Condition

Next, the deletion of the puzzle elements in Step S7 shown in FIG. **14** will be discussed in detail, referring to the sub-flowchart of FIG. **20**.

First, the CPU core **42** judges if a chain operation is being performed presently (Step S7*a*). Herein, the chain operation refers to a repeat of the deletion and movement of puzzle elements within a valid time, as can be understood by the following discussion. After the valid time passes, the chain operation is ended. Then, as discussed later, when a delete condition of puzzle elements is achieved, this chain operation is resumed.

The delete condition of puzzle elements is defined as a condition in which puzzle elements of the same kind in a predetermined number or more are continuously arranged in a predetermined direction, as discussed in <B-1>.

In a case where it is judged that no chain operation is being performed presently ("NO" in Step S7*a*), if the number of chain operations in the previous operation is set in the RAM **48**, the CPU core **42** resets the number of chain operations in the RAM **48** (sets 0 to the number of chain operations) (Step S7*b*). Herein, the number of chain operations refers to the number of achievements of the delete condition for the puzzle elements in the chain operations.

After that, the CPU core **42** sets a first delete condition in the RAM **48** as the delete condition of puzzle elements (initializes the delete condition, in other words, sets an initial value to the delete condition) (Step S7*c*).

Herein, the first delete condition is defined as a condition in which puzzle elements of the same kind in a first number or more are continuously arranged in a predetermined direction. In the present preferred embodiment, it is assumed that the predetermined direction includes vertical and horizontal directions and the first number is four. The first number may be arbitrarily set. The first number, however, is not smaller than three.

Further, as discussed later, the delete condition of puzzle elements changes as the chain operation goes on. In this preferred embodiment, for example, the predetermined number (m) restricting the delete condition is reduced as the chain operation goes on (e.g., the predetermined number changes from the first number to the second number which is smaller than the first number). Then, the predetermined number (m) is rewritten in the RAM **48** under the control of the CPU core **42**. The reduction of the predetermined number (m), however, can be performed until m=2, and therefore when m=2, the predetermined number is not further reduced.

Next, the CPU core **42** judges if puzzle elements of the same kind in the first number (four in this case) or more are continuously arranged in the vertical or horizontal direction in accordance with the operation of the player (Step S7*d*). In other words, the CPU core **42** judges if the first delete condition which is presently stored in the RAM **48** is achieved.

If the CPU core **42** judges that the first delete condition is not achieved ("NO" in Step S7*d*), through returning, the process goes to Step S8 of FIG. **14**. On the other hand, if the CPU core **42** judges that the first delete condition is achieved ("YES" in Step S7*d*), the CPU core **42** starts a chain operation (Step S7*e*).

First, under the control of the CPU core **42** and the GPUs **52** and **54**, as shown in FIG. **22**, a display indicating "during a chain operation", e.g., "CHAIN CHANCE", is made on the second LCD **14** (Step S7*f*). Subsequently, the CPU core **42** increments the number of chain operations (the number of achievements of the delete condition in the chain operations) which is stored in the RAM **48** by "1" (Step S7*g*).

Next, the CPU core **42** sets a first valid time in the RAM **48** (Step S7*h*). The first valid time is a valid time while the second delete condition is set as discussed later.

The length of the valid time may be determined in accordance with the delete condition of puzzle elements which is set (especially, the predetermined number (m) restricting the delete condition) or the present number of chain operations. For example, as the predetermined number (m) which is set becomes smaller, the valid time is set shorter (or longer). Alternatively, as the present number of chain operations becomes larger, the valid time is set shorter (or longer).

Herein, it is preferable from the viewpoint of tension of the game that the valid time should be set shorter as the predetermined number (m) becomes smaller and/or the number of chain operations becomes larger.

Next, the CPU core **42** starts a time counting operation (Step S7*i*). Herein counted is a time (first time) passing from the time when the first valid time is set.

Since the CPU core **42** judges that the presently-set delete condition (the first delete condition) is achieved in Step S7*d*, the puzzle elements satisfying the delete condition are deleted (Step S7*j*).

In the layout of puzzle elements shown in FIG. **21**, for example, it is assumed that the stick **24** is brought into contact with the hatched pentagon pattern and moves this pattern rightward. Then, as shown in FIG. **22**, in the second column from the left side, four pentagon patterns are continuously arranged in the vertical direction. At this time, the CPU core **42** judges that the presently-set delete condition (the first delete condition, and the first number (m=4) is set) is achieved and deletes these four pentagon patterns (Step S7*j*).

As can be seen from FIGS. **21** and **22**, when the deletion is performed, the score increases by predetermined points (fifty points are added in this preferred embodiment). Further, as can be seen from FIG. **22**, a new puzzle element (a puzzle element of pentagon in FIG. **22**) is created in the upper portion of the first LCD **12** (Step S3 discussed earlier).

As can be seen from FIG. **22**, when the puzzle elements are moved and deleted, a puzzle element which is stacked on the (deleted) puzzle elements before the movement or the deletion (a puzzle element of star shape stacked on the deleted puzzle elements in FIG. **22**) becomes floating. Then, the CPU core **42** next causes the floating puzzle element to fall downward (Step S7*k*).

Herein, the fall is performed until the floating puzzle element gets on a puzzle element which is present in the same column. If no puzzle element is present in the same column (in the case of FIG. **22**), the fall is performed until the floating puzzle element reaches the bottom portion.

Next, the CPU core **42** judges if the predetermined number (m) is "2" in the delete condition of puzzle elements which is stored in the RAM **48** (Step S71).

If the value of m is not "2" ("NO" in Step S71), the CPU core **42** reduces the value of m which is stored in the RAM **48** by "1" (Step S7*m*).

In other words, the delete condition which is stored in the RAM **48** is newly set (changed). The newly-set delete condition is defined as a condition in which puzzle elements of the same kind in the predetermined number after the reduction by "1" or more are continuously arranged in a predetermined direction.

This step is considered as a step where a next delete condition of the puzzle elements in which puzzle elements of the same kind in the second number which is smaller than the first number or more are continuously arranged in a predetermined direction is set as the second delete condition.

The amount of reduction for the first number is not necessarily limited to "1" but may be any value.

After the operation of Step S7*m* is finished, through returning, the process goes to Step S8 of FIG. **14**.

On the other hand, if the value of m is equal to "2" ("YES" in Step S71), the CPU core **42** does not reduce the value of m, and through returning, the process goes to Step S8 of FIG. **14**.

As discussed above, the first number restricting the delete condition in the first delete condition is not smaller than three. Therefore, the operation of Step S7*m* is performed at least one time.

In the above-discussed case, the first number restricting the first delete condition and the amount of reduction in the predetermined number (m) in Step S7*m* may be arbitrarily set. In such a case, in Step S71, the CPU core **42** makes the following judgment.

Specifically, the CPU core **42** judges the value of the predetermined number (m) restricting the present delete condition which is set (stored) in the RAM **48**. On the basis of the judgment result, if the value of the predetermined number (m) after reduction in Step S7*m* becomes smaller than "2" ("YES" in Step S71), the reduction of the predetermined number (m) is not performed.

On the other hand, if the value of the predetermined number (m) after reduction in Step S7*m* is not smaller than "2" ("NO" in Step S71), the reduction of the predetermined number (m) is performed. In this case, the predetermined number (m) is reduced by an arbitrarily-set value in Step S7*m*.

After that, through returning, the process goes to Step S8 of FIG. **14**.

Herein, Step S7*a* will be discussed again.

In Step S7*a*, if it is judged that the chain operation is being performed presently ("YES" in Step S7*a*), the CPU core **42** next judges if puzzle elements of the same kind in the predetermined number (m) or more are continuously arranged in the vertical or horizontal direction in accordance with the operation of the player (Step S7*n*). In other words, the CPU core **42** judges if the delete condition which is presently stored (set) in the RAM **48** is achieved (Step S7*n*).

If "YES" in Step S7*a*, naturally, the chain operation is being performed. Therefore, the delete condition stored (set) in the RAM **48** is changed from the initial delete condition (i.e., the first delete condition) to the second delete condition. In other words, as can be seen from the operation of Step S7*m*, the predetermined number (m) restricting the present second delete condition is smaller than the first number.

In this preferred embodiment, however, when the chain operation continues for a long time, the predetermined number (m) restricting the second delete condition eventually becomes "2". As can be seen from Step S71, when the predetermined number is "2", the reduction of the predetermined number (m) is not performed. Therefore, after the predetermined number (m) becomes "2", the second delete condition used for the judgment in Step S7*n* does not change from the previous second delete condition.

As the result of judgment in Step S7*n*, if it is judged that the presently-set second delete condition is not achieved ("NO"

in Step S7*n*), the CPU core **42** compares the first valid time set in Step S7*h* with the time obtained by counting in Step S7*i* until that time (Step S7*o*).

If the counted time falls within the first valid time ("NO" in Step S7*o*), the second delete condition is kept as the delete condition of the puzzle elements, and through returning, the process goes to Step S**8** of FIG. **14**. In other words, until the counted time exceeds the first valid time, the deletion of the puzzle elements can be repeated under the second delete condition.

On the other hand, if the counted time exceeds the first valid time ("YES" in Step S7*o*), the CPU core **42** decides the end of the chain operation (Step S7*p*). In this case, the delete condition of the puzzle elements is changed to the first delete condition, as can be seen from Steps S7*a* to S7*c* of FIG. **20**.

After that, as shown in FIG. **23**, the CPU core **42** erases the display of "CHAIN CHANCE" indicating "during a chain operation" which is made on the second LCD **14** (Step S7*q*). Herein, FIG. **23** shows the case where the delete condition is not satisfied within the first valid time after the state of FIG. **22**.

Further, the CPU core **42** detects the number of chain operations during the chain (i.e., the number of achievements of the delete condition) (Step S7*r*). Herein, the number of chain operations is equivalent to the number obtained by the increment in Step S7*g*. After that, through returning, the process goes to Step S**8** of FIG. **14**.

Herein, Step S7*n* will be discussed again.

As the result of judgment in Step S7*n*, if it is judged that the presently-set second delete condition is achieved ("YES" in Step S7*n*), the CPU core **42** causes the process to go to Step S7*g*.

In other words, the CPU core **42** further increments the number of chain operations which is stored in the RAM **48** by "1" (Step S7*g*).

Next, the CPU core **42** sets the second valid time in the RAM **48** (Step S7*h*).

The second valid time is a valid time while a new second delete condition is set as discussed later. The second valid time may be determined in accordance with the present number of chain operations and/or the predetermined number restricting the delete condition, as discussed above. In this preferred embodiment, the second valid time is shorter than the above-discussed first valid time.

Next, the CPU core **42** starts counting of the time (second time) passing from the time when the second valid time is set (Step S7*i*).

Since the CPU core **42** judges that the presently-set second delete condition is achieved in Step S7*n*, the puzzle elements satisfying the second delete condition are deleted (Step S7*j*).

In the layout of puzzle elements shown in FIG. **24**, for example, it is assumed that the stick **24** is brought into contact with the portion indicated in this figure and slidingly moved rightward. Then, as shown in FIG. **25**, in the third column from the right side, three puzzle elements of square are continuously arranged in the vertical direction. At this time, FIG. **24** shows a state where the chain operation continues from the state of FIG. **22**.

At this time, the CPU core **42** judges that the presently-set delete condition (The present delete condition is the second delete condition, and the second number (m=3) is set) is achieved and deletes these three puzzle elements of square (Step S7*j*).

As can be seen from FIGS. **24** and **25**, when the deletion is performed, the score increases by predetermined points (fifty points are added in this preferred embodiment). Further, as can be seen from FIG. **25**, a new puzzle element (a puzzle element of star shape in FIG. **25**) is created in the upper portion of the first LCD **12** (Step S**3** discussed earlier).

Then, the CPU core **42** next causes the floating puzzle element as a result of the movement and deletion of the puzzle elements to fall downward (Step S7*k*).

As can be seen from FIG. **25**, no puzzle element is stacked on the deleted puzzle elements in the case of FIG. **25**. But, with the movement, there exist floating puzzle elements (the puzzle elements over the second row from the bottom in the third column from the left side in FIG. **25**). Therefore, the floating puzzle elements are caused to fall downward (Step S7*k*).

Next, the CPU core **42** judges if the present predetermined number (the value of m) is "2" in the delete condition of the puzzle elements which is stored in the RAM **48** (Step S**71**).

If the value of m is not "2" ("NO" in Step S**71**), the CPU core **42** reduces the value of m which is stored in the RAM **48** by "1" (Step S7*m*).

In other words, the delete condition which is stored in the RAM **48** is newly set (changed).

This step is considered as a step where a next delete condition of the puzzle elements in which puzzle elements of the same kind in the third number which is smaller than the second number or more are continuously arranged in a predetermined direction is set as a new second delete condition.

The amount of reduction for the second number is not necessarily limited to "1" but may be any value, as discussed above.

After the operation of Step S7*m* is finished, through returning, the process goes to Step S**8** of FIG. **14**.

On the other hand, if the value of m is equal to "2" ("YES" in Step S**71**), the CPU core **42** does not reduce the value of the second number (the present predetermined number (m)), and through returning, the process goes to Step S**8** of FIG. **14**.

After that, as the result of judgment in Step S7*n*, if it is judged that the presently-set new second delete condition is not achieved ("NO" in Step S7*n*), the CPU core **42** compares the second valid time set in Step S7*h* with the time obtained by counting in Step S7*i* until that time (Step S7*o*).

If the counted time falls within the second valid time ("NO" in Step S7*o*), the new second delete condition is kept as the delete condition of the puzzle elements, and through returning, the process goes to Step S**8** of FIG. **14**. In other words, until the counted time exceeds the second valid time, the deletion of the puzzle elements is repeated under the new second delete condition.

On the other hand, if the counted time exceeds the second valid time ("YES" in Step S7*o*), the CPU core **42** decides the end of the chain operation (Step S7*p*). In this case, the delete condition of the puzzle elements is changed to the first delete condition, as can be seen from Steps S7*a* to S7*c* of FIG. **20**.

Through the above operation flow, the chain operation continuously occurs and when the condition is not satisfied, the chain operation is ended.

Herein, FIGS. **26** and **27** each show a state of chain operation after the state of FIG. **25**. As can be seen from these figures, since the predetermined number restricting the second delete condition is reduced from the second number (m=3) to the third number (m=2) (Step S7*m*), two puzzle elements of circle are deleted.

As the result of the movement of FIG. **25**, the floating puzzle elements are caused to fall downward (Step S7*k*). Further, a puzzle element of star shape which is newly created is caused to fall downward.

<B-6> Other Operations

Next, an operation of the game in which the proceeding of the puzzle game is changed in accordance with the number of

chain operations (the number of achievements of the delete condition in the chain operations) shown in FIG. **14** will be discussed in detail, referring to the sub-flowchart of FIG. **28**.

The operation of the game in which the proceeding of the puzzle game is changed in accordance with the number of chain operations refers to an operation to give a bonus score or give a predetermined puzzle element in the game field of the match opponent.

First, the CPU core **42** judges if the number of chain operations which is detected in Step S7*r* exists (Step S8*a*).

If the number of chain operations is not detected ("NO" in Step S8*a*), this means that the chain operation does not start or the chain operation continues. Therefore, through returning, the process goes to Step S9 of FIG. **14**. As a result, before the start of the chain operation or during the continuance of the chain operation, the proceeding of the puzzle game is not changed in accordance with the number of chain operations.

On the other hand, if the number of chain operations is detected ("YES" in Step S8*a*), the CPU core **42** next judges if the present play mode is a match play mode (Step S8*b*).

If the CPU core **42** judges that the present play mode is not a match play mode (i.e., a single play mode) ("NO" in Step S8*b*), the CPU core **42** changes the proceeding of the puzzle game in accordance with the number of chain operations which is counted in Step S7*g* and detected in Step S8*a* (Step S8*c*). Herein, in this case, since the present mode is not a match play mode, the CPU core **42** gives (adds) a bonus score (Step S8*c*).

In FIGS. **26** and **27**, for example, when the chain operation is ended after the state of FIG. **26**, the display of "CHAIN CHANCE" is erased from the second LCD **14** and the bonus score of 300 points in accordance with the number of chain operations is added in the first LCD **12** as shown in FIG. **27**.

Herein, it is possible to set the bonus score to be added higher as the number of chain operations becomes larger (in other words, bonus score=the number of chain operations× A:A is any value).

After the operation of Step S8*c* is finished, through returning, the process goes to Step S9 of FIG. **14**.

On the other hand, if the CPU core **42** judges that the present play mode is a match play mode ("YES" in Step S8*b*), the CPU core **42** changes the proceeding of the puzzle game in accordance with the number of chain operations which is counted in Step S7*g* and detected in Step S8*a* (Step S8*d*).

Herein, in this case, since the present mode is a match play mode, the CPU core **42** displays (creates) predetermined puzzle elements at given positions in the game field (the LCDs **12** and **14**) of the match opponent (see FIG. **29**) and causes the predetermined puzzle elements to fall (see FIG. **30**) (Step S8*d*).

Herein, it is possible to set a larger number of puzzle elements to be given to the match opponent as the number of chain operations becomes larger (in other words, the number of puzzle elements to be given=the number of chain operations×B:B is any value).

The puzzle elements to be given to the match opponent may be ones of the same kind as those which are deleted in the chain operation. In this preferred embodiment, the match opponents have different kinds of puzzle elements which are displayed in the initial screens and selected and displayed in Steps S2 and S3. Therefore, as discussed above, if the puzzle elements to be given are of the kind of the puzzle elements which the match opponent has, the number of kinds of puzzle elements on the receiving side increases. For this reason, it becomes harder for the player on the receiving side to satisfy the delete condition.

Among the puzzle elements to be given, the puzzle elements which are impossible to delete may be included.

After the operation of Step S8*d* is finished, through returning, the process goes to Step S9 of FIG. **14**.

In Step S9, the CPU core **42** judges if all the columns of puzzle elements reach the highest stage of the game field. In other words, the CPU core **42** judges if the puzzle elements are displayed with no space in the entire game field of the LCDs **12** and **14**.

If the CPU core **42** judges that all the columns of puzzle elements do not reach the highest stage of the game field ("NO" in Step S9), the CPU core **42** causes the process to return to Step S2 and repeats the operation of Step S2 and the following steps.

On the other hand, if the CPU core **42** judges that all the columns of puzzle elements reach the highest stage of the game field ("YES" in Step S9), the CPU core **42** ends the puzzle game (makes the game over) (Step S1O). In the case of match play mode, a player who first satisfies the condition of Step S9 ("YES" in Step S9) loses. As another preferred embodiment, in Step S9, the puzzle game may be ended when it is judged that any one of the columns of puzzle elements reaches the highest stage of the game field.

As can be seen from the above operation, in the game program and the game device **10** of this preferred embodiment, the first delete condition to delete the puzzle elements is restricted by the first number. When the first delete condition is achieved, the second delete condition is reset as the delete condition. The second delete condition is restricted by the second number which is smaller than the first number.

Therefore, in accordance with the proceeding of the puzzle game, it is possible to change the delete condition of the puzzle elements to an easier condition (from the first delete condition to the second delete condition). Accordingly, it is possible to easily perform the chain operation in which the deletion of the puzzle elements is repeated.

In the game program of this preferred embodiment, the first valid time is set when it is judged that the first delete condition is achieved. Further, the first time passing from the time when it is judged that the first delete condition is achieved is counted. If the first time obtained by counting falls within the first valid time, the second delete condition is set as the delete condition of the puzzle elements and if the counted first time exceeds the first valid time, the first delete condition is set as the delete condition of the puzzle elements. Therefore, since the valid time is set on the change of the delete condition to an easier one, it is possible to give the tension to the game.

In the game program of this preferred embodiment, a new second delete condition is set as the next delete condition of the puzzle elements when it is judged that the second delete condition is achieved. Further, when it is judged that the second delete condition is achieved, the second valid time is set and the second time passing from the time when it is judged that the second delete condition is achieved is counted. If the second time obtained by counting falls within the second valid time, the new second delete condition is set and if the counted second time exceeds the second valid time, the first delete condition is set. Therefore, it is possible to make the delete condition easier as the number of repeats of the deletion of the puzzle elements becomes larger, and even if only few puzzle elements are left after the repeat of deletion, it is possible to perform a chain operation in which the deletion of the puzzle elements is repeated, in a relatively easy manner.

In the game program of this preferred embodiment, the second valid time is shorter than the first valid time. For this reason, in order to keep the continuance of the chain opera-

tion, it becomes necessary to achieve the next delete condition earlier as the chain operation goes on. Therefore, it is possible to further increase the tension of the game.

In the game program of this preferred embodiment, when the chain operation is ended, the number of achievements of the delete condition in the chain operations (the number of chain operations) is counted up. Further, in accordance with the counted number, the proceeding of the puzzle game is changed. Therefore, since the proceeding of the puzzle game is changed in accordance with the number of chain operations in which the deletion of the puzzle elements is repeated, it is possible to achieve a changeful and interesting puzzle game.

In the game program of this preferred embodiment, the position and the direction on the second LCD **14** which are indicated are detected by the player's manipulation of the touch panel in association with the second LCD **14**. Then, a set of puzzle elements are specified in accordance with the detected position and the specified set of puzzle elements are moved in accordance with the detected direction. Therefore, since the puzzle elements can be manipulated by using the touch panel, it is possible to achieve an intuitive puzzle game with excellent operability.

While the invention has been shown and described in detail, the foregoing description is in all aspects illustrative and not restrictive. It is therefore understood that numerous modifications and variations can be devised without departing from the scope of the invention.

What is claimed is:

1. A computer software product including a recording medium in which a computer-readable program is recorded, said game program being used for causing a computer to perform a puzzle game in which a plurality of kinds of puzzle elements are sequentially created and displayed on display means while the layout position of said puzzle elements is changed in accordance with an operation of a player and when puzzle elements of a same kind are arranged continuously in a predetermined direction, said puzzle elements of the same kind which are continuously arranged are deleted, said game program causing a computer to execute:

a first delete condition setting step of setting a first number and setting a delete condition of said puzzle elements in which at least said first number of puzzle elements of the same kind are continuously arranged in a predetermined direction as a first delete condition;

a first delete condition judgment step of judging if said first delete condition is achieved in accordance with the operation of said player;

a puzzle element deleting step of deleting puzzle elements satisfying said first delete condition when it is judged that said first delete condition is achieved in said first delete condition judgment step;

a second delete condition setting step of setting a second number based on said first number such that said second number is less than said first number and setting a next delete condition of said puzzle elements in which at least said second number of puzzle elements of the same kind are continuously arranged in a predetermined direction as a second delete condition when it is judged that said first delete condition is achieved in said first delete condition judgment step; and

a second delete condition judgment step of judging if said second delete condition is achieved after said second delete condition is set,

wherein said puzzle element deleting step deletes puzzle elements satisfying said second delete condition when it is judged that said second delete condition is achieved in said second delete condition judgment step.

2. The computer software product according to claim **1**, causing said computer to further execute:

a valid time setting step of setting a first valid time while said second delete condition is set when it is judged that said first delete condition is achieved in said first delete condition judgment step;

a time counting step of counting a first time passing from the time when it is judged that said first delete condition is achieved in said first delete condition judgment step; and

a delete condition changing step of setting said second delete condition as the delete condition of said puzzle elements when said first time obtained by counting in said time counting step falls within said first valid time and setting said first delete condition as the delete condition of said puzzle elements when said first time obtained by counting in said time counting step exceeds said first valid time.

3. The computer software product according to claim **2**, wherein

said second delete condition setting means sets a next delete condition of said puzzle elements in which at least a third number of puzzle elements of the same kind are continuously arranged in a predetermined direction as a new second delete condition when said second delete condition judgment means judge that said second delete condition is achieved, said third number being smaller than said second number,

said valid time setting step sets a second valid time while said new second delete condition is set when it is judged that said second delete condition is achieved in said second delete condition judgment step,

said time counting step counts a second time passing from the time when it is judged that said second delete condition is achieved in said second delete condition judgment step, and

said delete condition changing step sets said new second delete condition as the delete condition of said puzzle elements when said second time obtained by counting in said time counting step falls within said second valid time and sets said first delete condition as the delete condition of said puzzle elements when said second time obtained by counting in said time counting step exceeds said second valid time.

4. The computer software product according to claim **3**, wherein said second valid time is shorter than said first valid time.

5. The computer software product according to claim **3**, causing said computer to further execute:

an achievement number counting step of counting a number of achievements of said delete condition; and

a game processing step of changing a proceeding of said puzzle game in accordance with said number of achievements counted in said achievement number counting step.

6. The computer software product according to claim **1**, wherein a touch panel is provided in association with said display means, said game program causing said computer to further execute:

a manipulation indication detecting step of detecting a position and a direction on said display means which are indicated with manipulation of said touch panel by said player; and

a puzzle element movement controlling step of specifying a set of said puzzle elements in accordance with said position detected in said manipulation indication detecting step and moving said set of puzzle elements specified

in accordance with said direction detected in said manipulation indication detecting step.

7. A gaming device, comprising

display means,

said game device performing a puzzle game on a computer, in which a plurality of kinds of puzzle elements are sequentially created and displayed on said display means while the layout position of said puzzle elements is changed in accordance with an operation of a player and when puzzle elements of a same kind are arranged continuously in a predetermined direction, said puzzle elements of the same kind which are continuously arranged are deleted,

said gaming device further comprising:

first delete condition setting means for setting a first number and setting a delete condition of said puzzle elements in which at least a first number of puzzle elements of the same kind are continuously arranged in a predetermined direction as a first delete condition;

first delete condition judgment means for judging if said first delete condition is achieved in accordance with the operation of said player;

puzzle element deleting means for deleting puzzle elements satisfying said first delete condition when it is judged that said first delete condition is achieved by said first delete condition judgment means;

second delete condition setting means for setting a second number based on said first number such that said second number is less than said first number and setting a next delete condition of said puzzle elements in which at least said second number of puzzle elements of the same kind are continuously arranged in a predetermined direction as a second delete condition when it is judged that said first delete condition is achieved by said first delete condition judgment means; and

second delete condition judgment means for judging if said second delete condition is achieved after said second delete condition is set,

wherein said puzzle element deleting means deletes puzzle elements satisfying said second delete condition when it is judged that said second delete condition is achieved by said second delete condition judgment means.

8. The game device according to claim **7**, further comprising:

valid time setting means for setting a first valid time while said second delete condition is set when it is judged that said first delete condition is achieved by said first delete condition judgment means;

time counting means for counting a first time passing from the time when it is judged that said first delete condition is achieved by said first delete condition judgment means; and

delete condition changing means for setting said second delete condition as the delete condition of said puzzle elements when said first time obtained by said time counting means falls within said first valid time and setting said first delete condition as the delete condition of said puzzle elements when said first time obtained by said time counting means exceeds said first valid time.

9. The game device according to claim **8**, wherein

said second delete condition setting means sets a next delete condition of said puzzle elements in which at least a third number of puzzle elements of the same kind are continuously arranged in a predetermined direction as a new second delete condition when it is judged that said second delete condition is achieved by said second delete condition judgment means, said third number being smaller than said second number,

said valid time setting means sets a second valid time while said new second delete condition is set when it is judged that said second delete condition is achieved by said second delete condition judgment means,

said time counting means counts a second time passing from the time when it is judged that said second delete condition is achieved by said second delete condition judgment means, and

said delete condition changing means sets said new second delete condition as the delete condition of said puzzle elements when said second time obtained by said time counting means falls within said second valid time and sets said first delete condition as the delete condition of said puzzle elements when said second time obtained by said time counting means exceeds said second valid time.

10. The game device according to claim **9**, wherein said second valid time is shorter than said first valid time.

11. The game device according to claim **9**, further comprising:

achievement number counting means for counting a number of achievements of said delete condition; and

game processing means for changing a proceeding of said puzzle game in accordance with said number of achievements counted by said achievement number counting means.

12. The game device according to claim **7**, wherein a touch panel is provided in association with said display means, said device further comprising:

manipulation indication detecting means for detecting a position and a direction on said display means which are indicated with manipulation of said touch panel by said player; and

puzzle element movement controlling means for specifying a set of said puzzle elements in accordance with said position detected by said manipulation indication detecting means and moving said set of puzzle elements specified in accordance with said direction detected by said manipulation indication detecting means.

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